RAILROAD GAZETTE

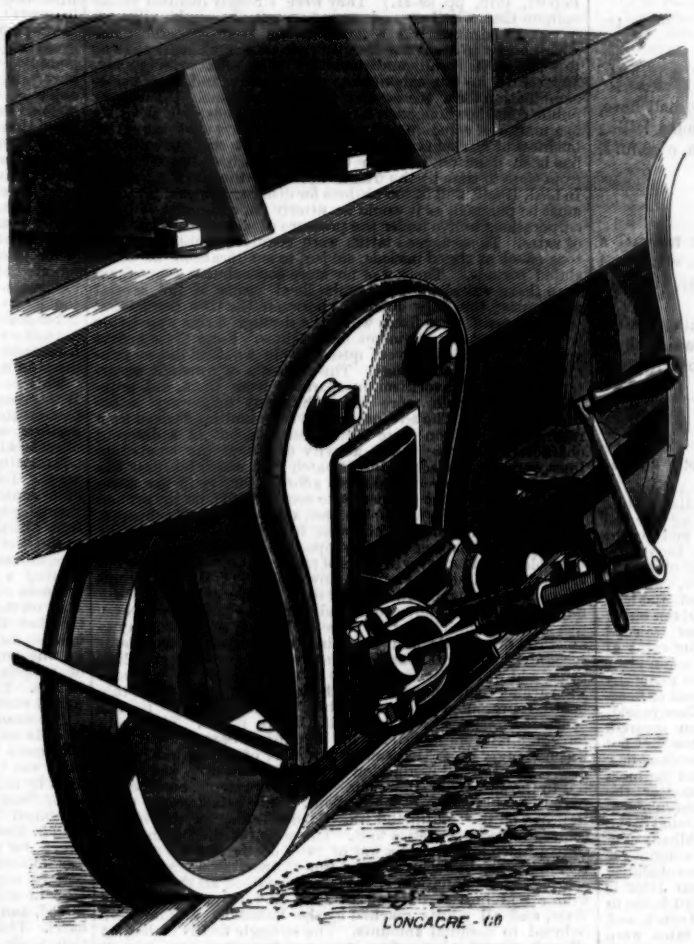
FRIDAY, FEBRUARY 18, 1876.

Patent Car-Box Drill, for Removing Broken Cap-Bolts from Car-Truck Boxes.

Most freight and coal-car boxes have plain caps over the openings in the boxes, held in position by a bolt on each side tapped into lugs on the boxes. These caps keep the dust and grit out of the bearings, and their presence is very important in prolonging the life of the brasses. Unfortunately, in practice, the bolts which hold them in place frequently break off, leaving a part remaining in the tapped hole in the lug, which must be removed before the cap can be replaced.

Cutting out this piece of bolt with a hammer and chisel is a tedious process, and drilling it out with any of the ordinary appliances consumes time and patience. As any device for facilitating this operation would be of interest to car inspectors and officials of roads using this kind of cap, we give an illustration of a machine for the purpose which has been brought to our notice.

As seen by the cut, the machine has four legs projecting below its base, with pointed set-screws which grasp the sides of the box, and can be adjusted to different widths of box. Tightening two of these set-screws fastens the machine. The drill can then be adjusted to either side, and a small hole drilled for a short distance into the broken bolt. This drill is then taken out of the spindle, and a square, tapering drill put in its place and forced, by the feed-screw, into the hole in the bolt until its corners are slightly imbedded, when the bolt is readily backed out by turning the crank and feed-screw in the reverse direction, the whole operation taking but a very few minutes. The machine is made of cast-steel, is strong, light, and easily handled. It is manufactured by Thorne, De Haven & Co., Twenty-first, above Market streets, Philadelphia.



PATENT CAR-BOX DRILL, BY THORNE, DeHAVEN & CO.

Contributions.

About Rail Joints and Matters Connected Therewith.

TO THE EDITOR OF THE RAILROAD GAZETTE:

It was not a great many months ago that the writer "chanced to be around" where a force of trackmen were relaying a road with steel rails, and some notes were taken concerning the manner in which the work was performed. Perhaps more than ordinary interest was felt in this particular case from the fact that the road had worn out two sets of rails, and those going down were to do duty for a company somewhat given to boasting of its good management and of the great skill and experience of its officers and their assistants. The work was not performed in accordance with the popular idea of scientific railroading, and safety and economy seemed to be nothing worth consideration; the principal object being to get the old rails up and the new ones down as quickly and cheaply as possible.

The road-bed was in fair condition, and there was an abundance of cross-ties, sound and in good condition, to receive the new rails; but there was no preparation made for the new joints. That is, the joints were allowed to come "any way at all," as the man in charge expressed it. The consequence was that some of the joints were on ties and some were "suspension" joints, and a large proportion were neither, some of the ends of the rails just reaching the edge of a tie. The joints occupied all positions on the surface of the ties and all distances midway between the ties, and the joints on one side of the track were not opposite those on the other. The fastenings used were of the ordinary four-bolted fish-bar style. These were screwed to place in a hap-hazard sort of way, some very tight, some rather loose, and so on. But little attention was paid to accuracy of gauge or curving the rails, and the work as as a whole was not what might be expected, especially when done under the direction of an imported engineer.

The writer ventured some suggestions as to a more thorough and uniform construction of joints, with a view to giving the rails a fair chance, but as these were replied to rather stiffly, but little was said on the subject. Having occasion to visit the scene of the above mentioned observations a few days since, it was thought advisable to "take an observation" and report on the situation and condition of things in that locality.

To put it mildly, the track is bad; not in a state of "mild decay," as Holmes has it, but rapidly going to destruction. Some of the fish-bars were broken, and rattled with a doleful sound when a train passed. At one joint, both bars were broken, one at the bolt-hole and the other at the ends of the rails. In this case the joint was on the edge of a tie and there was evidence of the bars being bent considerably before being broken. The end of the rail lying on the tie was flattened to a distance of four inches from the end, and at the end the head was one-fourth of an inch wider than when first laid. The end of this rail when not under pressure was three-sixteenths of an inch higher than its mate, which had no support for a distance of thirteen inches. A straight-edge laid longitudinally on the surface of these rails and over the joint showed that both rails had become bent vertically and "set," so that if a rail were taken up and laid on a plane surface it would rest on its ends, if its middle were kept from sagging by its own weight. Other joints, where the fish plates remained whole, showed a bending and "set" of the rails under the straight-edge, and the bend is of various degrees, according to the position of the ties and the manner in which the fish-bars had been kept screwed up. These were found to be in all stages of looseness, from one bolt slightly loose to all bolts out, and the bars in the gravel or lying in the scrap heap at some neighboring foundry. There were hardly any joints that might be said to be in good order, although some were found with plates tight and the rails but slightly bent and no perceptible spreading at the ends of the rails or anything to indicate undue wear. In such cases, the joints were either on the center of a tie or midway between two ties. It was also noticeable that where the most perfect joints were found, a bar of wood was interposed between the fish-bar and nut, similar to those used by Mr. Latimer on the Altantic & Great Western road, which, I believe, are highly approved by that gentleman. Some of the ends are badly bruised and unsafe, and there is an air of general neglect about the premises that is not in keeping with this age of scientific railroading.

The following are some of the conclusions that may be arrived at from the foregoing facts, viz.:

First. In laying the new rails, it would have been tiptop economy to have prepared and spaced the ties in such a manner as to give the joints proper support.

Second. If the ends of the rails do not meet on the center of a tie, the nearer they meet *midway between* two ties the better.

Third. It is *impossible* to support joints properly unless they are *very nearly* opposite each other; so that the same tie, or the same space, as the case may be, may answer for the opposite joints. This has no reference to the plan on some roads (and it is a very poor plan) of laying rails to "break joints," that is to have the joint on one side of the track come opposite the middle of the rail on the other.

Fourth. Fish-plates are of no use in supporting the ends of rails unless they are kept screwed tight.

Fifth. The lighter patterns of fish-bars in use have not sufficient strength, even if kept in place, to keep the rail straight under heavy traffic.

Sixth. The sections of most rails are such as to make it difficult if not impossible to keep them from spreading the fish-bars, and if screwed tight enough to hold them in place, it interferes with expansion and is liable to cause spreading of the rails and serious derailment.

Seventh. Some elastic substance such as wood or rubber is essential in keeping fish-bars in place, for the reason that when a bolt is strained about all it will bear to hold together three pieces of naked iron, a further strain by contraction from cold breaks the bolt, whereas a piece of wood or rubber may be compressed tight enough to hold "all fast" and still yield enough to prevent undue strain on the bolt by contraction.

Eighth. It is no wonder that this road is in the hands of a receiver. And finally that any rail splice or joint support on which the whole supporting power consists in the gripping or clasping of the rails alone, as at a suspension joint or on a single tie, is defective for the reason that in order to keep the joint up it must be gripped so firmly as to have a tendency to spread the track by expansion, or pull the rails or splice-bars in two by contraction. When rails and joint fixtures are strained almost to the breaking point by the action of heat or cold, the effect of heavy trains passing over them must be to cause more or less breakage. A remedy for this seems to have been discovered by Mr. Horace Harding, of Tuscaloosa, Ala., whose plan is to "yoke" four joint ties together in such a manner that the *ties* support the rails at the joint rather than the *gripes* or fixtures bolted to the rails. This "yoke" or "joint stiffener" is so arranged that four ties support the joint, leaving but a trifling strain on the fish bars or other fixtures. With Mr. Harding's device, no greater depression can take place at the joint than in the middle of the rail, as the "yoke" is a compensation for the break in continuity of the rail at the joint. It is interesting to notice the "don't care" disposition manifested by some who have charge of maintenance of way, and it is a mystery to the uninitiated how they manage to "hang on" from month to month and year to year and draw their salaries. There is enough wasted material on this line to build a narrow-gauge road. Narrow-gauge and narrow-policy men take notice.

WM. S. HUNTINGTON.

Exploding Frozen Dynamite.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Some time since a paper was read before the St. Louis Engineer's Club, asserting that frozen nitro-glycerine would not explode, detailing some experiments going far toward showing that it would not.

Facing page 44 of Mowbray's book is a picture of 12 cans of nitro-glycerine that had been "perforated, contorted, battered and portions of the tin and nitro-glycerine sliced off but not exploded" (when frozen) by the explosion of 1,600 lbs. of nitro-glycerine in a magazine 12 feet off.

It has been established by numerous experiments that Nobel's nitro-glycerine (T. P. Schaffner's in this country) *would* explode when frozen. Mowbray claimed that as his method of manufacture was different from the Nobel method, he obtained a different product, and I believe experiments seem to show that his nitro-glycerine was a little the most effective of the two. And Mowbray has been shipping his nitro-glycerine entirely in the frozen state, as I am told, thinking it safer than when fluid.

Now, if I can believe the daily press, Mowbray has had an accident from *frozen* nitro-glycerine, and I have had an accident (of an odd kind) from frozen dynamite or giant powder, No. 1, which is understood to be made from Nobel's nitro-glycerine, which *should* explode frozen, and, in fact, frozen samples from this same lot would explode in a lively and aggressive manner when placed on an anvil and struck with a hammer.

One day last Fall I pushed an electrical exploder about three inches into a cartridge 1¼ inches in diameter; the top of the cartridge was securely tied and dipped in tallow and beeswax; in addition to which I tied a wad of oakum on to the sending wires, so that the cartridge should not be bruised in forcing it into the hole. The top of the cartridge was between 2 and 2½ feet below the surface of the rock, and the rock was in 4½ feet water. The oakum and water constituted the only tamping. The temperature of the water was about 32°, as ice was making in still places. I did not notice whether the cartridge was frozen hard or not, but it probably was, as it was over an hour since the exploder had been put in it.

The charge missed fire, and on going to the hole I found about 1½ inches in length of cartridge with the oakum attached on the surface of the rock. The exploder had broken that cartridge and knocked it, wad and all, out of 2 to 2½ feet of hole under the pressure of 6½ feet of water without exploding it. As dynamite is a mechanical mixture of nitro-glycerine and infusorial earth, it may be thought that there was no nitro-glycerine in the cartridge. The fragment preserved is apparently nearly saturated with nitro-glycerine and small pieces light readily from the flame of a match, giving off the smoke and fumes that I believe are peculiar to burning nitro-glycerine.

The great interest that men occasionally have in the temperature and other surroundings that govern the explosive capabilities of nitro-glycerine will, I hope, excuse this communication.

N.

Information Wanted.

COLUMBUS, Ga., Feb. 9, 1876.

TO THE EDITOR OF THE RAILROAD GAZETTE:

A friend of mine, who is an engineer on the Central (Georgia) Railroad, say that when, while his engine is working hard, hauling a heavy train up a grade, with the throttle well open and the reversing lever back, so as to allow steam to follow almost to the end of the stroke, he opens his furnace door, the driving-wheels instantly slip round and round on the track. He asks if some one cannot, through the columns of the *Gazette*, explain this.

X.

Frogs and Turnouts.

TO THE EDITOR OF THE RAILROAD GAZETTE:

A good deal has been written upon this subject, but it is believed that the following table represents more conveniently the results, and agrees more closely with practice, than anything which has come under my notice.

Let the turnout be from a straight line, and let the beginning of the turnout curve of the center line of the turnout be opposite the heel or fixed ends of the switch rails. Then if the

switch rails be moved over to the turnout, and the curve run through a point midway between the movable ends of the switch rails, that is to say, that we consider the switch rails in their new position to be chords or part of the turnout curve.

The curve thus formed is dependent only on the length of the switch rails, and is easily produced, and the other data for finding and placing the frog, as follows:

Let t = length of switch rail in feet.
" d = throw of switch = 0.42 ft. = 5 in. usually.
" g = gauge = 4.7 ft. = 4 ft. 8½ in. usually.
" c = chord from heel of switch to point of frog, outer rail of turnout.
" f = length of frog from point back to a width of 6 ft.
" F = frog angle.
" R = radius of center line of turnout.

Then we have (v. Henck's Field Book, "Tangent Deflections.")

$$g = \frac{ct}{2R+g}, \text{ and } d = \frac{ft}{2R+g},$$

therefore,

$$d : g = ft : ct \text{ and } c = t\sqrt{\frac{g}{d}},$$

which for the usual values given above becomes:

$$c = 3.345\,t.$$

We have also

$$\text{Sine}\,\frac{1}{2}F = \frac{g}{c}, \text{ and } R = \frac{ct}{2g}\,\frac{1}{2}\,g.$$

Computing these values and other useful ones, for four different lengths of switch rails, and arranging in tabular form, we have:

t	=	15 ft.	18 ft.	21 ft.	24 ft.
R	=	265.50	383.36	522.65	672.36
Degree of curve.	=	21°42′	15°0′	11°0′	8°30′
Deflection angle.	=	10°51′	7°30′	5°30′	40.15′
f	=	2.659′	3.191′	3.723′	4.255′
	=	2′8″	3′2½″	3′8½″	4′3′
F	=	10°47′	8°59′	7°45′	6°44′
c	=	50.15′	60.18′	70.21′	80.24′

For the middle frog for a three-throw switch we shall have, by using one-half of the gauge in the above formulæ, letting c' = distance in ft. from point of frog to heel of switch, $c' = 0.707\,c$.

Let F = angle of middle frog

$$\text{Sine}\,\frac{1}{4}F = \frac{g}{1.404\,c}.$$

It will often be found that for a 24-ft. switch rail and a three-throw switch that the frog used for a 15-ft. switch rail can be used for the middle frog without difficulty, although nearly 1° too sharp.

In the yard of the Union Depot, at St. Louis, with rare exceptions rendered necessary by the curves into the tunnel, all the frogs measured by me were either 4 ft. 3 in. or 2 ft. 8 in., very nearly.

The Freight Competition of 1875.

[From the Seventh Annual Report of the Massachusetts Railroad Commissioners.]

In Appendix E of this report will be found statistical tables showing the grain and flour receipts at Boston during the last eight years, both directly by rail from the West, and by the mixed routes, partly rail and partly water. During the earlier of these years, it will be noticed that more than half of all the cereal products brought to Boston came by water, whereas more recently the proportion is altogether changed, and it is obvious that the mixed routes are gradually being driven out of the business. This result is partly due to improved railroad appliances, but much more to the steadily decreasing rates at which produce is carried. The change which has taken place during the last few years in this respect is not generally appreciated. The community has been so accustomed to hearing the cry for cheap transportation of Western produce raised, that it fails to realize how much cheapness has been secured. The fact is, however, that rates have now fallen so low that not only this, but all other descriptions of through merchandise, are habitually carried on more favorable terms than the most sanguine anticipated a few years ago. In this matter, the experience of one or two roads is, probably, the experience of all. That of the Michigan Central has recently been stated in the annual report of that company; that of the Boston & Albany may be obtained from the official returns. The average amount received by the Michigan company for each ton of merchandise carried by it in 1865, was 3.06 cents per mile; a year later it was 2.60 cents; in 1867 it was 2.09 cents; in 1870 it had fallen to 1.98 cents; in 1872 to 1.56 cents. In 1874 it was 1.30 cents, and in 1875 it was 1.16 cents. In other words, in 1875 rates were but a trifle more than one-third part of what they were in 1865—a reduction of two-thirds in ten years.

The experience of the Boston & Albany road was very similar, as will be seen from the following table, which gives in cents the average amount received by that corporation on every ton of freight carried by it during each of the eleven years specified. It will be noticed that the decrease is 60 per cent:

1865	3.55 cents.	1871	2.09 cents.
1866	3.16 "	1872	2.02 "
1867	2.98 "	1873	1.96 "
1868	2.81 "	1874	1.82 "
1869	2.43 "	1875	1.53 "
1870	2.19 "		

During the year 1875, many railroads, not only in the West, but in New England, have persistently done their through freighting business at rates lower than those charged on the Erie canal; and this, too, notwithstanding the fact that the roads in question carried all descriptions of merchandise, while only the bulkier and coarser kinds were moved by canal.* It cannot, of course, for a moment be maintained that the railroad corporations have voluntarily, or from any sense of obligation to the public, submitted to these reductions. They have certainly been actuated by no such motives. They have worked for less money, for the simple and obvious reason that there were a great many roads to do the work, and a smaller amount than was expected of work to do. Nevertheless, experience is uniform that railroad charges, when once they fall, tend always to a lower permanent level than that at which they stood before they fell. It is highly improbable, therefore, that railroad rates will ever again rise for any length of time to a point which six years ago was considered a low average.

The time has now come when these facts should be recognized, and due prominence given to them. So far as the bringing food cheaply from the West to the East is concerned, they indicate clearly enough that, for the present at least, the problem is solved; inasmuch as it is apparent that the railroads have gone quite as far in this direction as it is safe for them to go. So far, indeed, that a number of the more cautious and conservative corporations have voluntarily abandoned the business, refusing to compete for through traffic, on the express ground that it could only be done at a loss. The returns which accompany this report afford ample evidence that such a conclusion was not unwarranted. Many of the roads have been operating on margins of profit dangerously narrow. Take, for instance, the Boston & Lowell and the Cheshire. These two companies make a connection with the Vermont Central and Grand Trunk lines for through business with the West. During the last railroad year the Boston & Lowell moved its freight trains, weighing on an average 225 tons each, at a net profit of only 7 cents a mile. The Cheshire moved its trains of 168 tons at the even lower profit of 6 cents per mile. The two roads together moved 933,532 tons of freight, at a net profit of a little less than $62,000, or about 6 cents on each ton handled. Lower figures than these could not be reached without converting the freighting business into a railroad luxury.

Low as the rates have been generally during the past year, Boston has further been especially favored by a combination of circumstances, which is not likely to prove permanent. It has enjoyed for the time being an active railroad competition, especially as respects western-bound merchandise, in which those operating the longer and more expensive of two lines insisted upon a right to charge less than the shorter line. To understand, however, the present posture of affairs, as respects the relations of the great through eastern and western lines with each other, and consequently with the localities they serve, it is necessary to recur to events which were taking place a year ago, when the last annual report of this Board was made. The combination of through lines which had been effected at a meeting of railroad officers held at Saratoga in August, 1874, and for that reason known as the "Saratoga Conference," was then breaking up, owing to the refusal of the Baltimore & Ohio road to become a party to it. During the brief time which it lasted, that combination called forth very marked indications of public disapproval. It was looked upon as a compact against public policy, and one in every way prejudicial to the interests of the community at large. The members of this Board took, however, a wholly different view of the matter. (Sixth Annual Report, 1875, pp. 39–41.) They were strongly inclined to the opinion that, whether so designed or not, the combination effected at Saratoga was a move in the right direction; one which ought to be, if not directly encouraged, at least allowed to work out its results undisturbed. Its essential principle lay, apparently, in the substitution of an open and responsible combination for a secret and irresponsible one. Upon every public consideration, such a change seemed most beneficial. It is a matter of common notoriety that for years past the whole business of transportation between the West and the seaboard has been done on common tariffs, established in convention from time to time by the freight agents of the different roads. Indeed, it was, and is, too obvious for discussion that this course must be pursued, as it would be utterly impossible for railroad corporations to live under the pressure of an unremitting war of rates. These agreed tariffs were regularly published, and took effect at stated periods, subject to modifications at other stated periods. There was no more concealment about them than there was about the regular local tariffs of the several companies; the only difference between the two being that the local tariffs were fixed, while the through tariffs were liable to sudden breaks and violent fluctuations. From these breaks and fluctuations it is very questionable whether the community derived any advantage. The elements of constant uncertainty and local favoritism, inseparable from them, did, probably, on the whole, more harm than any temporary reductions did good. The advantages the communities derived from railroad competition were decided enough, but of a different character. They lay in the activity to which the competing lines were stimulated; in the dispatch with which business was done; in the approved appliances afforded for it; in the unremitting efforts of the companies to secure traffic, on the ground that they did it quicker, safer, better, and consequently cheaper, than other companies. This great feature in competition the Saratoga combination did not propose to touch. The attempt was solely to do away with wars of rates, through the agency of arbitration. It did not look to any pooling of profits or common purse arrangement. It left each company to get all the business it legitimately could, and to retain for itself whatever was earned from it. But, in place of leaving each company to assert its own rights, and to maintain them if it was able, it recognized a central board, the duty of which was to establish rates, and which was supposed to have sufficient power to hold the various companies firmly to them. Though, therefore, this board represented a close combination, in doing so it concentrated responsibility on itself. There it was. The whole force of public opinion could be brought to bear upon it, and was no longer dissipated among a number of subordinate agencies. Naturally, the adhesion of all the trunk lines was essential to the success of the plan. This, however, it became apparent, could not be brought about. The Baltimore & Ohio Railroad on the south, and the Grand Trunk on the north, refused to become parties to it. The action of the Baltimore & Ohio at once brought on a war of rates of the fiercest description between that company and the Pennsylvania road, representing the combination. This was sustained all through the winter and into the spring of 1875, and rates between the West, and all points reached by the Baltimore & Ohio were reduced to nominal amounts. The struggle finally ended, as all such struggles heretofore have, and hereafter must, end, in an agreement. The Baltimore & Ohio became one of the combination of roads on the old footing of tariffs agreed upon in conferences of freight agents. The only thing, practically, which the struggle resulted in, therefore, was the destruction of all that was good in the Saratoga arrangement, and the restoration of the worst features of the old irresponsible combination. The board of arbitration, and the two all-important elements of publicity and direct responsibility which it had promised to introduce into the relations between the community and its great railroad lines, disappeared in the conflict.

Meanwhile, the understanding arrived at between the agreeing routes and the Baltimore & Ohio did not perfect the combination. The Grand Trunk of Canada still refused to enter into it, and the position of that road was of peculiar importance to Boston. The Grand Trunk, as between Boston and the West, is what is known as the long line; that is, taking Chicago as a terminal point, it is 150 miles further to the West by this route than by the Boston & Albany and its connections. Owing, however, to the fact that the natural outlet of the Grand Trunk is closed by ice in winter, those managing it are anxious to secure business, especially during that season. Accordingly, its agents have for years claimed that the agents of more direct lines should not regard rates a certain per cent. lower than their own as a "cut," on the ground that, as the Grand Trunk had the longer route, and occupied more time in carriage, it must charge less money for it in order to compensate for these disadvantages, and secure a share of the business. Rather than engage in a war of rates, always most disastrous to solvent roads like the Boston & Albany and the New York Central, when carried on against an insolvent corporation like the Grand Trunk, this claim, though never recognized, had been for several years tacitly allowed to the extent of from 5 to 20 cents a hundred on through freights. Taking advantage of this concession, the Canada line had secured for itself a portion of the business between Boston and the West. When, however, the difficulty with the Baltimore & Ohio was adjusted, the attention of the combined roads was next directed to the Grand Trunk, and that company was made to understand that no concession in rates would in future be permitted to it. This brought on a struggle for the Boston business.

As respects the eastern-bound freight movement the position of the Grand Trunk connection was of comparatively little practical importance, though even here it was productive of some singular results. It so happens that the Grand Trunk possesses no independent connection with Chicago. It can reach that city only in a circuitous way, or over the tracks of companies which belong to members of the central combination. When, therefore, the war of rates began, these companies refused to reduce their charges from Chicago to the East, although charges were reduced from Milwaukee and points further west. Accordingly, merchandise began to move in a heavy volume from these points across Lake Michigan and over the Detroit & Milwaukee road, which connected with the Grand Trunk, to Boston, and even to New York. To the roads composing the central combination, this was, however, matter of little comparative moment. The merchandise transported was bulky in character, and the rates obtained on it were ruinously low. Indeed, the combined lines were probably not unwilling to have their competitor wear itself and its connections out in the unprofitable work of carrying heavy freights at 3 mills per ton per mile; and the returns of the Cheshire and Boston & Lowell roads show clearly enough how rapidly this wearing-out process was going on. Indeed, it has been notorious for years that certain of the Grand Trunk connections in New England have made a practice of bringing western produce east at rates which did not pay car hire. In the settlements, the balance was actually against them, the car mileage exceeding the freight money, so that they paid for the privilege of hauling the merchandise over their roads. As respects the western-bound movement, however, the case was altogether different. As the eastern freight movement consists of coarse and bulky articles, it necessarily calls for a much greater number of cars to accommodate it than the movement from the East, which consists chiefly of manufactured goods. Accordingly, there is always a great superfluity of rolling-stock going west. It costs a railroad no more, however, to haul a car with two or three tons of merchandise in it than a car which is empty; and it is even thought that a car travels better for having a small average load. Under these circumstances, with great numbers of empty return-cars on their hands, every pound of freight the companies can pick up in the East is pure gain, no matter at what rates they carry it. The only objection to their taking the lowest possible rates being the obvious one that, if having already brought merchandise East for nothing, they then carry other merchandise West on the same terms, the financial results will not be encouraging. This consideration was one which did not affect the Grand Trunk line, inasmuch as the business would on equal conditions naturally seek the direct and shorter route; if the rates were equal, therefore, the Grand Trunk, as the longer route, would get none of it; whereas, by breaking rates, it might get more or less, and all it got was so much gain. When the conflict began, accordingly, the Grand Trunk resorted to a policy of active competition which resulted in lower rates ruling, especially during the closing months of the last year, between Boston and Chicago, than between any other seaboard point and the interior. The rates from New York, for instance, were at times nearly twice as high as those from Boston. Thus at both ends of the line competition led to discrimination.

This condition of affairs could not of course continue long. It was another of those disturbing phases which continually present themselves in the process through which railroad competition works its way out into railroad combination. The other seaboard cities could not be expected to look on with equanimity while a rival enjoyed such wholly factitious advantages. To the corporations serving those cities, the matter was of no consequence, inasmuch as the war of rates did not reach them, except in so far as it induced the shipment of merchandise from Philadelphia or New York to Boston, to be carried thence to the West by rail. This diversion of business was, however, insignificant, and no steps were for some time taken toward putting a stop to the discrimination. At last, however, the business communities of these other cities, especially of New York on the seaboard and Chicago in the West, began to realize that their interests were suffering. This rising public opinion soon made itself felt. In presence of it, those managing the combined lines found themselves under the necessity of adopting some decisive policy. Their alternative was simple. They had either to enter into a new and destructive war of competition, or buy the Grand Trunk off.

The usual steps were, therefore, taken, with the usual result. In this case, however, competition resulted in combination with more than ordinary rapidity. In December, the war of rates was begun, the combined roads reducing those from New York by more than half at once, so as to bring them below those from Boston. A meeting of the representatives of the combined lines and the Grand Trunk connections was then held in New York. The usual general discussion took place, which, for the moment, seemed to promise small results. This was followed by a private conference between those immediately representing the lines principally concerned, at the close of which it was announced that all differences were adjusted, and that rates would at once be restored to a paying basis. This adhesion of the Grand Trunk line to the combination, made it, for the time being, complete.

That a war of rates was thus averted affords no good cause for regret. Neither the community nor the railroads could have derived any permanent benefit from it. It would merely have caused more unjustifiable discriminations, wider fluctuations and deeper business disturbance. It is, however, unfortunate that the arrangement effected was not of a more comprehensive character. It did not touch the root of the evil, and, like many similar previous arrangements, it will prove but temporary.

However it may be under exceptional circumstances and for brief periods, in the long run active competition between the through routes cannot but be prejudicial to Massachusetts' interests. It leads directly to discriminations in favor of rival communities. It does so for the obvious reason that, as a rule, railroad competition is and must continue to be stronger to New York and to other seaboard points than to Boston. They own and control their own through routes, and Massachusetts does not. If the Hoosac Tunnel line was consolidated under one vigorous management, and brought into close connection with the Erie and Pennsylvania roads, the conditions of the problem might be altered. That result, however, seems now improbable, and the "toll-gate policy" acts simply as a paralysis on the possibilities of the tunnel route, in the interest of the New York Central. In the struggle of competition, therefore, Boston stands in a poorer position to protect itself than any other seaboard city. In the long run, the discrimination will surely be against it, in the future as in the past.

It would seem, therefore, to be the true policy of this section to encourage, rather than to discourage, a general public combination of the through railroad routes, based on principles of equality and stability. The law of the strongest does not work in our favor, and we cannot permanently steal business. Before a permanent combination is arrived at, however, there are certain principles the concession of which, as part of the accepted policy of any general railroad system, is essential. Foremost among these is the absolute equality of the Atlantic seaboard centers as respects the movement of merchandise to and from certain of the great distributing points of the West. Hitherto, owing to traditions of the past, or to the influence of competition, or to the superior activity of one freight line over another, discriminations between these cities have always exist-

* Report of the Commissioner of Railroads for Michigan, 1874, p. xi.

ed. Freights have, for instance, been 5 cents a hundred more to Boston than to New York, and 5 cents more to New York than to Philadelphia, and, at one time, 5 cents more to Philadelphia than to Baltimore. There is no longer any ground upon which to rest distinctions so arbitrary. Taking into consideration the volumes of traffic seeking the two cities, and the grades which have to be surmounted in crossing the Alleghenies to get to one of them, there is less than no reason why produce shipments to New York should be at higher rates than to Philadelphia; while, as between New York and Boston, the additional charge of 5 cents a hundred represents an increased rate of 12 per cent. to meet 5 per cent. of increased distance. This, too, while over the same lines no discrimination at all is made between the two cities in regard to western-bound merchandise, and while an equal discrimination the other way on the same merchandise is made by the Grand Trunk for a longer distance. It is certainly not in the power of the Boston & Albany road, as representing the interests of this section, to insist on the discontinuance of this exaction. That road is but a part, and, though a very important, not a large part of a continuous line. It does not and cannot control a through connection, and, without that, it is in no respect master of the situation. It cannot undertake to dictate. At the same time, it may fairly be expected to exert every influence it can control to this end, and the representatives of the State in its direction should see that this is done. The competition of the Grand Trunk line might also be made a powerful factor in the bringing about of this result. The business community of Boston should combine to offset the combination of the railroads. They should deal with that line which offers the equality, and thus compel others to do the same. Should they take this course, throwing their business unitedly, through the action of their Boards of Trade and Exchanges, in favor of one line as against another, recent experiences show clearly enough that the desired result would soon be accomplished. In this respect, the Legislature can do little; the business community, if it really chooses to organize and help itself, can do much.

There are other matters, also, in respect to which the principle of equality between centers seems yet to be ignored. The guaranteeing of quantities in bills of lading on produce shipments is a case in point. There has been much complaint on this subject during the past year, and not apparently without cause. As a matter of custom, certain transportation companies guarantee a delivery of the exact quantity of cereals expressed in the bill of lading in case of shipments to New York, but decline to do so in the case of shipments to Boston. This renders the bills of lading to the former place negotiable, while those to the latter place are not. In a business point of view, the difference is most material. This is another result of competition, and one most difficult to deal with. There is no question whatever that the only proper and business-like way of moving cereals in bulk would include a guarantee of quantity on the part of the carrier. This, however, implies a very considerable development in the method in which the business is done. To be weighed properly, grain must be passed through an elevator; and, if the railroad companies are to guarantee weights, they must own or supervise the elevators at each end of the route. Until this very considerable change in system is brought about, it is not easy to see how the business can be conducted as it should be. Meanwhile, at present there is no one to hold responsible. The contract, including the guarantee, is made at some Western center. The parties making it violate no law in giving a guarantee by preference, and are amenable to no tribunal. It is very difficult, also, to ascertain in any given case who they represent—whether the combined roads or private dispatch lines; and the combined roads, indeed, insist upon it that no guarantees binding upon them are permitted. Under these circumstances, a counter combination of merchants, agreeing to give their business in preference to any line guaranteeing quantities, would probably be the most effective way of solving the difficulty. It is not easy to see how anything else can.

These, and many other questions connected with through transportation, have of late been much discussed, and it is well that they should be. The more they are discussed, however, the more it will become plain that their only effective solution lies in the establishment, as a fundamental principle, of exact and absolute equality in railroad communication between the trade centers of the seaboard and the interior; and this in its turn implies a combination of through routes sufficiently close and powerful to enforce stability and justice among themselves. Competition in rates is necessarily incompatible with these principles—its essence is instability, and the artificial preferment of one point over another. So long as it continues, systematic justice cannot be done. Competition is nothing but force, and a practically irresponsible force, appealed to as the final arbiter in railroad disputes. The strongest corporation, or combination of corporations, invariably remains master of the field. This system has, since the close of the late war, been working itself out to its logical consequences with great rapidity; and it is now apparent that the only possible struggle is between some four, or at most five, great organizations. The ultimate result no longer admits of doubt, although a great majority of those who discuss the subject fail to realize the fact. The combination in the future, as in the past, will yearly become closer, and the tendency will be greater to adjust matters of dispute by some less costly process than a railroad war. But with the closer combination will necessarily come a recognized and concentrated public responsibility. The controversy which has been described between the combined roads and the Grand Trunk line furnishes an admirable illustration in point. The combination had made some one responsible, and, when public opinion was aroused, it knew at once, both in New York and Chicago, exactly whom to hold to account. The result was immediate. It is from just this point of view that the failure of the combination, effected through the conference at Saratoga, was to be regretted. Whether those who brought that combination about intended it or not, it apparently must have so centered responsibility, and consequently have so concentrated public opinion on itself, that a much greater degree than heretofore of equality and justice to all would have characterized the dealings of the railroads with each other, and consequently with the public. It seems, therefore, desirable as well as probable that this principle of public arbitration should, at no remote day, be substituted for that law of might which now, from time to time, agitates at once the railroad system and the business community. Meanwhile, the existing complications must be regarded as the necessary process through which those principles are worked out, upon which the better system of the future will be founded.

Transportation in Congress.

In the Senate, on the 9th, Mr. Kelly, of Oregon, called up the bill to extend the time for completing the Northern Pacific Railroad, to which the Committee on Railroads had reported amendments extending the time eight instead of ten years, and making the bill apply to the line through the Columbia valley, and not to the proposed loop line from Lake Pend d'Oreille across the Cascade Mountains to Puget Sound.

Mr. Sargent moved to recommit that an amendment might be framed to protect settlers on the granted lands.

The bill was then laid over.

Discussion on the above bill was resumed on the 10th. The amendment moved by Mr. Sargent, of California, was adopted, as follows:

"That this extension is granted upon the express condition and understanding that where pre-emption and homestead claims were initiatory, or private entries and locations were allowed upon lands embraced in the grant of said company, prior to the receipt of the orders of withdrawal at the respective District Land Offices, the lands embraced in such entry shall not be held as within the grant of said company, and shall be patented to the parties lawfully entered under the provisions of the section," &c. He said along the line of the Central Pacific Railroad in California, men who went there before the grant was made and settled, and subsequently sold their improvements, supposing they had the right to do so, had lost all.

Another amendment proposed by Mr. Edmunds, of Vermont, was adopted, providing that the act shall not be construed to affect private rights otherwise than is provided in it; and that the act and the company's charter, and all litigation relating to it shall be subject to repeal.

Mr. Ingalls, of Kansas, moved to strike out the proviso in the second section that it should not apply to lands heretofore patented to the company, nor to entries already canceled and upon which the purchase money has been returned to the respective parties in interest. Agreed to.

The bill was then passed by a vote of 35 to 18.

Mr. Frelinghuysen, of New Jersey, called up the Senate bill to amend certain provisions of the Revised Statutes of the United States relating to the transportation of animals. The amendment reported by the Judiciary Committee to the effect that animals shall not be confined in any railroad car or vessel without food or water for a longer period than twenty-four consecutive hours, and that they shall have time for rest and water of at least seven consecutive hours, providing that the amendment shall take effect on July 4, 1876, &c., were agreed to. The bill, after a brief discussion, was passed. This bill, it was stated, was intended as a substitute for the present law. It had been submitted to the leading cattle dealers, who approved it, and it was also approved by several prominent railroad lines. The object of the bill, it was stated, was to protect the animals, and at the same time to protect every one who ate beef or pork.

This bill was strongly opposed by several members, Mr. Ingalls, of Kansas, saying that under it, as first presented, any citizen of New York or Pennsylvania, appointed as an agent of a society for the prevention of cruelty to animals, could go to Kansas or any other State and make arrests and interfere with the business of railroad companies, and upon his motion an amendment was adopted with regard to arrests, so as to read that "every United States Marshal shall, upon application in writing of any duly incorporated society for the prevention of cruelty to animals, appoint a deputy marshal, who shall, thereupon, within the jurisdiction of such marshal, have power to make arrests, etc. The bill finally passed by a vote of 30 to 24, nearly a party vote, the Democrats generally contending that the bill assumed powers not belonging to the general government, which renders it probable that the bill will fail in the House.

In the Senate, on the 14th:

A bill was passed granting right of way for a railroad through the United States arsenal grounds at Benicia, Cal., with an amendment that Congress shall have the right at any time to alter, amend or repeal the act.

The Senate bill extending the time for the completion of the Oregon Central Railroad and Telegraph Line from Portland to Astoria and McMinnville was called up. An amendment was made to protect homestead rights and entries made prior to notice of the withdrawal of the granted lands from market, and one providing that nothing in the bill shall be construed to affect existing private rights, and that Congress shall have power to alter, amend or repeal the act, and that the company shall file its assent to the provisions of the act with the Secretary of the Interior, and the bill was then passed. Senator Mitchell said that the grant was made in May, 1870, and that all of the road but about 80 miles had been constructed.

Mr. Conkling, of New York, introduced a bill to "facilitate the transit of merchandise from the Dominion of Canada through the territory of the United States." It provides that section 3,102 of the Revised Statutes shall be made applicable to all merchandise intended for transit through the United States for export to a foreign destination, and empowers the Secretary of the Treasury to make such rules and regulations as may be necessary for that purpose. The section referred to embodies the law of June 27, 1864, which provided that merchandise in cars, sealed and manifested by an American Consul in Canada, should pass on without inspection to the port of destination in the United States, for payment of duty or warehousing. The construction placed on this law by the Treasury Department has limited its application to goods destined for consumption or re-distribution in the United States. Senator Morrill (Maine) last year endeavored to secure a broader construction by the department, which should allow merchandise intended for exportation from Portland and other Atlantic cities to come through at Island Pond, Buffalo, Suspension Bridge, and other frontier ports of entry, under seal, without stoppage for inspection and entry, but the opposition of the local customs officers, based on considerations of their fees, &c., prevailed so as to continue the unnecessary delays and expenses then complained of. It has been shown by official reports that the inspection at places like Island Pond is only nominal, as there are no adequate facilities for unloading or storing the merchandise, but a serious detention is caused by the present practice, and in the case of petroleum, oil, etc., the unloading involves great danger from fire.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

United New Jersey.—The New Jersey Legislature met in joint convention, Feb. 9, and re-elected Charles A. Butts, of Burlington State director for the ensuing year.

West Jersey.—At the annual meeting in Camden, N. J., Feb. 8, the following directors were chosen: Thomas Jones Yorke, Thomas H. Dudley, Alexander G. Cattell, Camden, N. J.; Samuel A. Whitney, Glassboro, N. J.; Charles E. Elmer, Salem, N. J.; Lewis Mulford, Millville, N. J.; John M. Moore, Clayton, N. J.; Coleman F. Leaming, Cape May Court House, N. J.; J. M. DuBarry, Harrisburg, Pa.; Josiah Bacon, Strickland Kneass, George B. Roberts, George Wood, Philadelphia. The new directors are Messrs. Cattell and DuBarry, who replace A. W. Markley, deceased, and S. M. Felton. The board elected George B. Roberts President; A. J. Cassatt, Vice-President, Wm. Taylor Secretary and Treasurer.

Atlantic & Lake Erie.—At the annual meeting in Lancaster, O., Feb. 9, the following directors were chosen: Thos. Ewing, Lancaster, O.; F. O. Marsh, Granville, O.; W. C. Lemert, Bucyrus, O.; F. M. Miles, Millville, O.; H. P. Platt, Toledo, O.; M. V. B. Pratt, New York. The board elected Thos. Ewing President; F. O. Marsh, Vice-President; W. C. Jones, Secretary and Treasurer.

Schuylkill Navigation Company.—At the annual meeting in Philadelphia, Feb. 8, Frederick Fraley was chosen President, with the following directors: John N. Hutchinson, Charles W. Wharton, Geo. Brooks, Charles Baber, Michael Ward, C. d'Invilliers. The board elected Richard Wilkins Secretary and Treasurer.

Boston, Clinton & Fitchburg.—At the annual meeting, Feb. 8, the number of directors was increased from twelve to fourteen, and the following were chosen: Lyman Nichols, Nathaniel Thayer, Cyrus Yale, Wm. D. Peck, Harrison Bliss, George A. Torrey, Hale W. Page, Francis B. Fay, Wm. J. Rotch, Solomon H. Howe, H. N. Bigelow, Jonathan Holbrook, Nathaniel Thayer, Jr., Thomas Rice.

Miami Valley.—At the annual meeting in Lebanon, O., Feb. 8, the following directors were chosen: S. S. Haines, Waynesville, O.; D. Allen, J. V. Lewis, Samuel Irons, Lebanon, O.; K. R. M. Cox, Mason, O.; J. Huston, Pleasant Ridge, O.; T. P. Townsley. The board elected S. S. Haines President; S. Irons, Vice-President; Philip Golay, Cincinnati, O., Chief Engineer.

Lowell & Andover.—At the annual meeting in Lowell, Mass., Feb. 9, Frederick Ayer was re-elected President and Benjamin Walker Clerk and Treasurer. The road is leased to the Boston & Maine.

Connecticut Central.—At the annual meeting in Broad Brook, Conn., Feb. 9, the old board was re-elected as follows: John W. Phelps, George Wilcox, Amos D. Bridges, Francis Gowdy, John W. Stiles, Joseph A. Thompson, E. S. Henry, Nelson S. Osborn, Lemuel Stoughton. Messrs. Henry L. Goodwin and John S. Clapp were elected auditors.

Boston & Albany.—At the annual meeting in Boston, Feb. 9, the old board of directors was re-elected, as follows: Chester W. Chapin, Springfield, Mass.; Henry Colt, Pittsfield, Mass.; Edward B. Gillett, Westfield, Mass.; D. Waldo Lincoln, Worcester, Mass.; Ignatius Sargeant, Ginery Twichell, Brookline, Mass.; Moses Kimball, Boston; George O. Crocker, New Bedford, Mass.

Wallkill Valley.—Mr. James A. Jones has been appointed Receiver in the suit brought by the trustees to foreclose the first mortgage. He is now Superintendent of the road.

Mackinaw & Marquette.—Capt. E. L. Craw, of Fruitport, Mich., is President, and A. G. Webster, of Chicago, Secretary of a new company just organized to build this road.

Philadelphia & Erie.—At the annual meeting in Philadelphia Feb. 14, the following directors were chosen: Robert Thompson, Samuel G. Lewis, Wistar Morris, Strickland Kneass, Joseph W. Gaskill, Josiah Bacon, A. J. Derbyshire, Samuel G. Thompson, J. Alexander Simpson, Alexander Biddle. The only new director is Mr. Biddle, who replaces George B. Roberts.

Syracuse & Southwestern.—The directors of this company have elected the following officers: Wm. L. Burt, of Boston, Mass., President; Robert Dunlop, Sr., Vice-President; H. W. Poor, New York, Treasurer; O. B. Curran, Secretary. These officers are all connected with the Utica, Ithaca & Elmira Company.

Marietta & North Georgia.—Mr. W. H. Wells has been appointed Chief Engineer.

Harrisburgh & Conewago.—The officers of this new company are: President, J. E. Wells; directors, Andrew Bentz, John Williams, Wm. Anthony, R. F. Elcock, Levi River; Secretary, A. Hetrick.

Flushing, North Shore & Central.—It is understood that Mr. Webster Snyder, General Manager of the Long Island Railroad, will have charge of this road and the Southern of Long Island also.

Mount Sterling Coal.—The following officers were chosen at the recent annual meeting: C. J. Glover, President; J. Q. Ward, Vice-President; Frank Fitch, Secretary; William Mitchell, Treasurer.

Atlantic & Gulf.—At the annual meeting in Savannah, Feb. 9, the following directors were chosen: John Screven, R. D. Arnold, Wm. Duncan, C. E. Groover, Henry Lathrop, Edward Lovell, Alfred Haywood, D. G. Purse, Savannah, Ga.; R. H. Hardaway, A. F. McIntyre, W. J. Young, Thomas County, Ga.; C. J. Munnerlyn, W. O. Fleming, Decatur County, Ga.; Julian Hartridge, Albany, Ga. Mr. Hartridge is the only new director, replacing M. B. Lovell.

Marquette, Houghton & Ontonagon.—Mr. W. C. Browe has been appointed General Ticket Agent, with office at Marquette, Mich.

Fort Wayne, Jackson & Saginaw.—At the annual meeting in Fort Wayne, Ind., Feb. 8, the following directors were chosen: A. P. Edgerton, J. H. Bass, S. C. Evans, J. H. Clark, Fort Wayne, Ind.; C. W. O. McClellan, Waterloo, Ind.; Jos. A. Woodhull, Angola, Ind.; P. B. Loomis, D. Merryman, E. A. Webster, W. D. Thompson, W. R. Reynolds, H. H. Smith, Jackson, Mich.; E. O. Grosvenor, Jonesville, Mich.

General Passenger & Ticket Agents' Association.—At the annual meeting in Louisville, Ky., last week the following officers were chosen for the ensuing year: President, C. P. Atmore, Louisville & Nashville & Great Southern; Vice-President, H. C. Wentworth, Michigan Central; Secretary, Samuel Powell, Chicago, Burlington & Quincy; Executive Committee, W. L. O'Brien, Pittsburg, Cincinnati & St. Louis; E. St. John, Chicago, Rock Island & Pacific; C. K. Lord, St. Louis, Kansas & Northern.

Ohio & Toledo.—At the annual meeting in Carrollton, O., recently, the following directors were chosen: A. R. Arter, D. Eckley, E. R. Eckley, S. Hawley, E. McGuire, J. B. Ritchey, W. C. Scott. The board elected E. R. Eckley President; Stanton Weaver, Secretary and Treasurer; H. Bidler, Auditor, H. E. Johnson, Superintendent. Mr. Johnson was recently connected with the St. Louis, Iron Mountain & Southern.

Peoria, Pekin & Jacksonville.—Mr. J. F. Kelsey has been appointed Superintendent, relieving President Allen, who has for some time performed the duties of that office. Mr. Kelsey formerly held the same position.

Jeffersonville, Madison & Indianapolis.—Mr. J. D. McIlwain has been appointed Assistant to Master Mechanic Wells, and will have charge of the car department. Mr. McIlwain was formerly Master Car Builder of the Lake Shore & Tuscarawas Valley road, and has lately resided in Denison, Tex.

PERSONAL.

—It is said that Mr. Isaac D. Barton has resigned his position as General Superintendent of the Flushing, North Shore & Central Railroad.

—Mr. Henry Tyson, formerly Master of Machinery of the Baltimore & Ohio, for several years in charge of the Baltimore street railroads, for a time Fourth Vice-President of the Erie, and more recently Receiver of the Chesapeake & Ohio, has been appointed United States Shipping Commissioner for the port of Baltimore.

TRAFFIC AND EARNINGS.

Freight Rates Southward.

The Atlanta (Ga.) *Herald* of Feb. 10 says: "Yesterday Col. Fink announced officially that on account of contracts made by the Central road with parties in Selma, the Virginia & Tennessee Air Line had been forced to cut rates, and to meet the troubles arising from this action the following rates were issued for the guidance of lines in association:

"From Boston, New York, Philadelphia and Baltimore to Atlanta, Augusta, Macon, Selma and Montgomery:

	New rates.	Old rates.
1st class, per 100 lbs	60 cents.	170 cents.
2d " "	60 "	140 "
3d " "	55 "	110 "
4th " "	50 "	90 "
5th " "	45 "	80 "
6th " "	40 "	60 "

"Our merchants can at a glance appreciate the immense reduction, and they will no doubt be as much surprised that this

break-down should have resulted from the action of the Central (which has been regarded as the creator of the association) as they are gratified that it has occurred. The 'association,' or 'pool,' or whatever it was called, was a very good thing for Mr. Wadley as long as the Central got the business, but when business went by other routes, down went rates and up went the pool."

Railroad Earnings.

Earnings for various periods have been reported as follows:

	1874-75.	1873-4.	Inc. or Dec.	P. c.
Year ending Sept. 30:				
Buffalo, New York & Philadelphia	$673,222	$580,666	Inc.. $92,556	15.9
Expenses	436,074	376,971	Inc.. 59,103	15.7
Net earnings	$237,148	$203,695	Inc., $33,453	16.4
Earnings per mile..	5,564	4,799	Inc.. 765	15.9
Per cent. of expenses	64.77	64.92	Dec.. 0.15	0.2
Year ending Dec. 31:	1875.	1874.		
Atlantic & Gulf	$965,870	$1,032,256	Dec.. $66,386	6 4
Expenses	638,942	732,061	Dec.. 93,119	12.7
Net earnings	$326,928	$300,195	Inc.. $26,733	8.2
Earnings per mile...	2,792	2,983	Dec.. 191	6.4
Per cent. of expenses.	66.15	70.92	Dec.. 4.77	6.7
Louisville, Cin. & Lexington	1,133,952	1,121 298	Inc.. 12,654	1.1
Expenses	820,595	900,390	Dec.. 79,795	8.9
Net earnings	$313,357	$220,908	Inc.. 92,449	41.9
Earnings per mile...	4,909	4,854	Inc.. 55	1.1
Per cent. of expenses.	72.37	80 23	Dec.. 7.86	9.8
Philadelphia & Erie	$3,365,897	$3,506,919	Dec.. $141,022	4.0
Expenses	2,228,484	2,438,133	Dec.. 209,649	8.2
Net earnings	$1,137,413	$1,068,786	Inc.. $68,627	6.4
Earnings per mile..	11,687	12,177	Dec.. 490	4.0
Per cent. of expenses.	66.21	69.30	Dec.. 3.09	4.5
Union Pacific	11,993,834	10,559,889	Inc.. 1,433,952	13.6
Expenses	4,982,048	4,652,315	Inc.. 329,733	7.1
Net earnings	$7,011,784	$5,907,565	Inc..$1,104,219	18.7
Earnings per mile...	11,622	10,232	Inc.. 1,390	13.6
Per cent of expenses	41.54	44.05	Dec.. 2.51	5.7
West Jersey	659,798	623,391	Inc.. 36,407	5.8
Expenses	367,510	437,691	Dec.. 70,181	16.0
Net earnings	$292,288	$185,700	Inc.. $106,588	57.4
Earnings per mile..	5,155	4,870	Inc.. 285	5.8
Per cent. of expenses	55.70	70.21	Dec.. 14 51	20.8
Month of December:				
Great Western of Canada	$366,400	$374,000	Dec.. $7,600	2.0
Expenses	285,000	315,500	Dec.. 30,500	9.7
Net earnings	$81,400	$58,500	Inc.. $22,900	39.1
Per cent. of expenses.	77.78	84.36	Dec.. 6.58	7.8
Houston & Texas Central	401,592	317,657	Inc.. 83,935	26.4
Expenses	184,377	157,785	Inc.. 26,573	16.9
Net earnings	$217,215	$159,872	Inc.. $57,343	36.0
Per cent. of expenses.	45.91	49.66	Dec.. 3.75	7.5
Louisville, Cin. & Lexington	98,908	.....	....	....
Expenses	65,314	.....	....	....
Net earnings	$33,594	.....	....	....
Per cent. of expenses.	66.04	.....	....	....
Month of January:	1876.	1875.		
Central Pacific	$961,000	$963,938	Dec. $2,938	0 3
Chicago, Milwaukee & St. Paul	527,000	466,101	Inc.. 60,899	13.1
Cin., Lafayette & Chicago	32,256	33,790	Dec.. 1,534	4.5
Denver & Rio Grande..	33,562	20,801	Inc... 12,761	61.4
Illinois Central	588,447	597,222	Dec.. 8,775	1.5
Indianap., Bloom., & Western	133,386	116,542	Inc.. 16,844	14.5
Kansas Pacific	208,039	162,737	Inc.. 45,302	27.8
Marietta & Cincinnati..	167,256	152,805	Inc.. 14,451	9.5
Michigan Central	518,567	500,902	Inc.. 17,665	3.5
Missouri, Kansas & Texas	256,459	198,100	Inc.. 58,359	29.5
Ohio & Mississippi	315,795	251,396	Inc.. 64,399	25.6
St. Louis, Alton & Terre Haute Bellville Line.	39,313	57,201	Dec.. 17,888	31.3
St. Louis, Iron Mt. & Southern	352,200	250,789	Inc.. 101,411	40.4
St. Louis, Kan. City & Northern	246,535	208,088	Inc.. 38,447	18.5
Toledo, Peoria & Warsaw	99,208	71,437	Inc.. 27 771	38.9
First week in February:				
Chicago, Milwaukee & St. Paul	$116,000	$70,700	Inc.. $45,300	64.1
Missouri, Kansas & Texas	53,960	53,806	Inc.. 155	0.3
Week ending Jan. 21:				
Great Western	£15,719	£14,642	Inc.. £1,077	7.4
Week ending Jan. 22:				
Grand Trunk	£37,000	£32,800	Inc.. £4,200	12.8

Central Pacific earnings are compared with 1874 as follows:

	1876.	1874.	Increase.	P.c
Month of January:	$961,000	$848,558	$112,442	13.3

Coal Movement.

The anthracite production for the week ending Feb. 5 was: 1876, 286,387 tons; 1875, 250,771 tons; increase, 35,616 tons, or 14.2 per cent.

Bituminous and semi-bituminous tonnages for the month ending Jan. 28 are reported as follows:

	Tons.
East Broad Top Railroad	5,775
Bellefonte & Snow Shoe Railroad	3,710
Pennsylvania Railroad, Allegheny Region	15,859
" " Pittsburgh Region	29,178
Southwest Pennsylvania Railroad	5,633
Penn and Westmoreland gas coal	54,046
Total	114,201
Coke, Pennsylvania Railroad and branches	58,048

Mr. R. G. Moulton, General Agent of the combined anthracite coal companies, furnishes the following statement for 1875:

	Shipments to interior points.	Shipments to competitive points.	Total shipments.
Philadelphia & Reading	2,999,343	1,785,160	4,784,504
Del. & Hudson Canal	1,484,141	1,542,117	3,026,258
Lehigh Valley	2,070,545	1,231,496	3,302,042
Central of New Jersey	1,383,648	1,277,986	2,661,635
Del., Lacka. & Western	1,620,815	1,318,833	2,939,648
Pennsylvania Coal Co.	184,458	1,183,749	1,368,207
Totals	9,742,950	8,339,341	18,082,294

The total shipments in 1874 were 18,626,000 tons, showing a decrease last year of 543,706 tons, or 2.9 per cent. Three companies, the Reading, the Lehigh Valley and the New Jersey Central showed a decrease, the other three an increase.

Michigan Freight Rates.

At a meeting of the freight agents of the lines leading from the lumber districts of Michigan, held in Chicago, Feb. 10, it was resolved that rates on lumber and grain from Springfield, O., and Dayton to Washington and Wilmington, O., added to the rates to Springfield and Dayton from Toledo, Sandusky and Detroit and points in Michigan governed by those rates, shall be the same as by Junction City; that lumber or timber of extra lengths, requiring more than one car to transport it be charged a minimum of 20,000 pounds for each car used; that roads leading from Chicago shall not reduce their rates on lumber, as per tariff of Jan. 17, unless by agreement with the lines from Lake Erie ports.

The meeting adjourned to meet in Cincinnati, March 9.

Chicago Live Stock Rates.

The following rates per 100 lbs. went into effect recently on stock shipped from Chicago:

Chicago to—	Cents per 100 lbs.
New York	60
Baltimore	52
Philadelphia	54
Buffalo, Suspension Bridge, or Pittsburgh	32
Albany	50
Dunkirk	30
Toledo	20

Freight Rates Eastward.

A meeting of general freight agents was held in Chicago, Feb. 11, the companies represented being the Pennsylvania Company, the Pittsburgh, Cincinnati & St. Louis, the Michigan Central, the Lake Shore & Michigan Southern, the Chicago & Alton, the Toledo, Peoria & Warsaw, the Baltimore & Ohio, the Vandalia Line, the Indianapolis & St. Louis, the Toledo, Wabash & Western, the Ohio & Mississippi, the Illinois Central, the Chicago, Burlington & Quincy, the Cleveland, Columbus, Cincinnati & Indianapolis, and the Indianapolis, Bloomington & Western. The following schedule of rates was adopted, to take effect Feb. 15:

From	Boston. 4th class.	Gr'n.	New York. 4th class.	Gr'n.	Philadelp'a. 4th class.	Gr'n.	Baltimore. 4th class.	Gr'n.
	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.
Chicago and State Line	55	50	50	45	43½	39	40	36
St. Louis	63	57	58	52	53	47	50	45
Indianapolis	50	46	45	41	40	36	37	34
Cincinnati	47	42½	42	37½	37	32½	32	28½
Louisville	54	..	49	..	44	..	39	..
Peoria, Pekin & Hav'na	60	55	55	50	50	45½	49	44½
Burlington and Kook'k	55	60	60	55	55	51	53½	49
Quincy, Hannibal and Louisiana	67	61	62	56	57	52	56	50
Davenport and Rock Island	65	59	60	54	55	50	53	48
Springfield, Decatur, Lacon, Delav'n, Bl'mington, Minier, Mas'n City, Gibson, Jacksonville, Chapin, Tuloma, Gibson, Clinton, Ill., Paxton, Hoopston, Farmer City, Bement, Pulaski, Taylorsville and Bushnell	55	60	60	55	55	51	53½	49
Beardstown	64	58	59	53	54	49	51	46
Champaign	64	59	59	54	54	50	52½	48
Danville, Ill.	60	56	55	51	50	46	47	44
St. Joseph, Atchison, Leavenw'rth & Kans's City	78	70	73	65	68	60	65	58

It was resolved that freight from local non-competitive points shall pay the agreed through rates from the points at which it leaves the line on which it originates; that the lines west of the Mississippi be apprised of this action at once, and requested to make corresponding rates from Mississippi points to the East at the same time; in the event of their neglect or refusal to adopt the rates named, the agreed rates on Mississippi River points shall apply on business from all points west of the river.

A committee was appointed to notify the lines west of the Mississippi. Resolutions were passed asking the co-operation of the managers of the trunk lines, and the meeting adjourned, subject to the call of the Chairman, Mr. James Smith, of the Chicago & Alton.

THE SCRAP HEAP.

Shetucket River Bridge, Norwich & Worcester Railroad.

After examination of the competitive plans and strain sheets submitted by various bridge companies, under the very rigid specifications sent out for this bridge, the design of the Keystone Bridge Company was selected as best fulfilling all the conditions, and the contract was awarded them for the sum of $25,000, payable only after the bridge shall have successfully withstood the specified tests, and a further use of the bridge for 15 days, without developing any defects.

The tests were made on Jan. 19, under direction of J. R. Jones, Engineer of the Keystone Bridge Company, with the following results:

Length of span, 15 panels, 15 ft. 6 in. each, making 234 ft. from center to cente. of end pins. Height of double intersection truss, 31.2 ft. center to center of chords. First test with two engines and tenders coupled, weighing 51 tons each, on middle of span. Center deflection, 0.6 inch.; camber restored after removal of load. Second test with two engines and tenders in middle of a train of loaded coal cars. The engines at middle of span, balance of span covered with loaded coal cars, load stationary; center deflection 1.08 inches; camber restored.

Third test with two engines in middle of train running at high speed, center deflection 1.2 inches. Camber fully restored on removal of load.

Weight of engines and loaded cars, 200 tons; span, 234 ft.; maximum center deflection, 1-2340 of span; limit of deflection allowed by specifications, 1-1200 of span.

Proposals for Iron.

Major D. W. Flagler will receive at the Rock Island Arsenal, Rock Island, Ill., sealed proposals for 30,000 lbs. 12-inch wrought-iron I beams; 85,000 lbs. 7-inch wrought-iron deck beams; 105,000 lbs. 4-inch wrought-iron I beams; 20,000 lbs. T iron from 2¼ by 3½ inch to 2¼ by 5¼ inch; 56,000 lbs. round bar iron from ⅝ inch to 2¼ inches diameter, and 38,000 lbs. flat and square bar iron, various sizes.

The name or place of manufacture of the iron must be stated. The beams will be subject to inspection and test, and will be required to possess the stiffness and strength indicated in the published charts of the manufacturer.

The flat and round iron is required to be of the best quality, highly refined iron, to give an ultimate tensile strength of not less than 54,000 lbs. per square inch, and to bear a tensile strain of 22,000 lbs. per square inch, without permanent set, and will be thoroughly tested as above, and by bending, welding, etc.

Bids for any other than the high grade of iron required will not be considered.

Proposals should be indorsed "Proposals for Iron," and will be opened at 10 a. m., March 10, 1876.

Any further information can be obtained from Major Flagler, as above.

Railroad Manufactures.

The Schenectady (N. Y.) Locomotive Works have received an order from the Central Pacific Company for a number of engines, and have increased the working force.

The Erie car shops at Elmira, N. Y., are very busy on passenger cars, of which a number are to be turned out in preparation for the passenger travel of next summer.

The rolling mill, nail factory, blast furnace and ore lands of the Hollidaysburg & Gap Iron Works, formerly known as the Juniata Iron Company, located at Hollidaysburg, Blair County, Pa., are offered for sale separately or as a whole. If not sold sooner, the property will be offered at public sale in Hollidaysburg, March 15.

The Passaic Rolling Mills at Paterson, N. J., are running with a full force.

Mr. C. V. N. Kittredge, long of the firm of Kittredge & Smith, bridge-builders, became a member of the board of trustees of the Kellogg Bridge Company, of Buffalo, last May, and at the recent annual meeting was chosen Secretary and Treasurer of the company.

The car shops of Gilbert, Bush & Co., at Green Island, N. Y., are running full time with 350 men. They have orders on hand for the New York Elevated Railroad, the Wagner Sleeping Car Company, and a railroad in Chili, South America.

A Deceived Conductor.

The Easton (Pa.) *Express* is responsible for the following:

It happened the other day on the Lehigh Valley Railroad. The train had just left Easton and the conductor was making his first round, when he observed a small white dog with a bushy tail and bright black eyes sitting coolly on the seat beside a young lady so handsome that it made his heart roll over like a lopsided pumpkin. But duty was duty, and he remarked in his most deprecatory manner:

"I'm very sorry, madam, but it's against the rules to have dogs in the passenger cars."

"Oh! my, is that so?" and she turned up two lovely brown eyes at him beseechingly.

"What in the world will I do? I can't throw him away. He's a Christmas present from my aunt."

"By no means, miss. We'll put him in a baggage car, and he'll be just as happy as a robin in Spring."

"What! put my nice white dog in a nasty, stuffy, dirty baggage car!"

"I'm awfully sorry, miss, I do assure you, but the rules of this company are as inflexible as the laws of the Medes and them other fellows, you know. He shall have my overcoat to lie on, and the brakeman shall give him grub and wa er every time he opens his mouth."

"I just think it's awful mean, so I do; and I know somebody will steal it, so they will." and she showed a half-motion to cry that nearly broke the conductor's heart; but he was firm, and sang out to the brakeman, who was playing a solo on the stove:

"Here, Andy, take this dog over into the baggage car, and tell 'em to take just the best kind of care of him."

The young lady pouted, but the brakeman reached over and picked the canine up as tenderly as though it was a two-weeks' old baby, but as he did so a strange expression came over his face, like a wave of cramp colic, and he said hastily to the conductor—

"Here, you just hold him a minute till I put this poker away," and he trotted out at the car door and held on to the brake-wheel, shaking like a man with ague.

The conductor no sooner had his hands on the dog than he looked around for a hole to fall through.

"Wh-wh-why, this is a worsted dog."

"Yes, sir," said the little miss, demurely. "Didn't you know that?"

"No, I'm most awful sorry to say I didn't know that," and he laid the Christmas dog down in the owner's lap, and walked out on the platform, where he stood half an hour in the cold, trying to think of a hymn tune to suit the worst sold man on the Lehigh Valley road.

Passing the Family.

The Aurora, (Ill.) *Beacon* says, speaking of a certain railroad officer:

"Speaking of Cross, reminds us that when he first removed to Riverside numerous Irish women and colored men were employed in the work of house-cleaning and they were sent to and from the city day by day on Mr. C.'s family pass. One day this pass was presented to Hi. Evans by a charming young lady. The affable conductor inquired, 'Are you a member of Mr. Cross' family?'

"'Yes sir,' was the reply, accompanied by a winning smile.

"'Singular,' muttered Hi., 'I have seen this pass several times, but supposed Mr. C.'s family were all Irish!'

"The young lady's eyes flashed fire, and in a thoughtful mood Evans resumed his call for 'Tickets!'

"Next day Sam Crance was in charge of the train which conveyed the young lady to the city, and the same pass was presented.

"'Are you a member of Mr. Cross' family?' asked the conductor.

"'I am, sir,' said the lady, in an irritated tone, 'I have the honor of being his daughter.'

"Sam looked suspicious, but finally remarked:

"You will excuse me for being so particular, but our orders are imperative. This pass has been presented to me several times of late, and I—was—under—the—impression that Mr. Cross was a colored man!'

"The flush of indignation which overspread the countenance of the lady was more convincing than argument, and Sam abandoned his investigations.

"Of course Miss C. related the occurrence to her father, and his rage knew no bounds. He registered a solemn vow to kill every conductor on the line, but what he would have satisfaction. Several weeks elapsed before he discovered the offending ones, and by that time his feelings were considerably mollified and both Hi. and Sam still live."

A Rich Engineman.

The Jersey City *Argus* says: "Lloyd Clark, an engineer on the Long Branch Division of the Central Railroad, is probably the richest man holding such a position in the country. For several years he ran an engine on the Central Pacific road, during which time, becoming seized with the speculative fever, he launched out, buying and selling gold and stocks, always with success, until at the end of five years he came east, the owner of between $75,000 and $100,000. He established himself in New York with a view of living in a manner consistent with his means, but such a life was too irksome, and after several attempts he gave up the experiment, and securing a position on the Central went to work at his favorite business. Mr. Clark is one of seven brothers, all of whom are railroad engineers in different parts of the world."

Bessemer Steel Production.

A yearly trade report issued by Wm. Bird & Co., of London, says:

"While other branches of the iron and steel trade have been great sufferers from the absence of large buyers, Bessemer steel has attracted increased attention. The power of supply of this article from Great Britain, the United States, France, Belgium, Germany and Austria, far exceeds the immediate requirements of the world, greatly as these have recently expanded, the annual powers of production being about 2½ million tons against a consumption of but at present 500,000 to 600,000 tons per annum. The difference between Bessemer steel and iron rails, which was in England about £3, is now reduced to about £2 per ton, but abroad it is less; and quite recently, in a Continental tender, we find that option of choice between iron rails with four years' guarantee, and steel rails with ten years' guarantee, was given with a difference of only 3s. per ton. This, we should think, must hinder any great improvement for the present in the iron rail trade, which, from its large requirements of raw materials, has been the backbone of our trade. Another reason which militates against the iron

rail is the discovery by which, by the aid of ferro-manganese, old iron rails can be worked up into homogeneous rails at a less cost than by the employment of hematite pig iron, and at a time when disused iron rails threatened to become a drug such a discovery is most welcome.

No Railroad Could Cheat Her.

She came from South Bend, and when she got off the train she discovered that her big satchel hadn't come along with the baggage. She flourished her check under the baggage master's nose and she loudly demanded "that satch-eel," and after a long hunt, he was forced to say:

"Madam, there is some mistake. I'm very sorry, but the satchel is sure to come on the next train."

"Do you s'pose I'm going to wait around here till to-morrow?" she indignantly responded, pushing the check under his eyes.

"You can go on and we'll forward it, madam."

"I'd look purty going on and leaving that satchel to foller," she exclaimed. "Every dud I've got in the world 'cept these on my back, are in it, and I'm going to have 'em or this road will get sued!"

He made another search, failed to find it, and said:

"It must have been left, but it's sure to come."

"Where's the boss of this road?" she demanded, waving the check around. "I'm going to see if I am to be defrauded of a satchel chuck full of as good clothes as any woman of my age in Indiana ever put on!"

The man pointed down the depot, and she walked up to the ticket office and called at the agent:

"See here, mister, I want forty dollars or my satchel!"

"I don't know anything about your satchel," he replied.

"You don't, eh!" she said, throwing down the big brass check. "What's that?"

"A check, madam."

"Yes, a check for my satchel, and now the satchel can't be found! It's probably bin stolen, but I know everything in it. There was three chemises with ruffles around the top; one new night-gown; two pair of stockings, darned in the heels; one gray dress, which cost twenty-eight cents a yard in South Bend; another night-gown, torn on the back; two check ——"

"It was detained, and will be here on the next train," he int errupted.

"But I'm bound for Oswego, and I don't care for any of your next trains," she snapped.

"Well, you'll have to see some one else; I have nothing to do with the baggage.'

"I will see some one else, young man! I'll see the man who bosses the road, and I'll have my satchel or pay for it, or I'll have the whole crowd of you put in jail!"

Turning away she caught sight of a policeman, and said:

"Be you a police?"

"Yes'm."

"Well, then, I want this railroad arrested! They've stolen my satchel!"

"Oh, I guess you'll find it all right," he replied. "Baggage is frequently lost, but it turns up again. You have the check all right?"

"Yes, and I can remember every article in it. There is a nightgown torn in the back; there is a bottle of hair revigorator that was never uncorked; there's one new nightgown with a ruffle around the top; there's two yards of flannel for my daughter's baby; there's a white envelope; there's a bottle of goose oil; there's—"

"Oh, well, it'll come along," interrupted the officer.

"And I've got to wait?"

"Yes, or go and let them send it."

"I vum if I will!" she said, pushing the check into his car; "I'm going to have that satchel or the pay for it! I'd look purty landing in Oswego with these old duds on, wouldn't I?"

"Well, I can't help you."

"Well, I'll help myself! The Wilkinsons never did let any one impose on 'em yet, and we shan't 'low it now!"

She got a boy to show her upstairs to the general offices, and walking into the superintendent's room, she asked:

"Be you the boss of this road?"

"I'm the Superintendent," he replied.

"You see that check?"

"Yes."

"Well, that's my satchel check. The satchel hain't here: it's been stolen or lost. I want forty dollars right away."

"You'll have to see the baggage master, madam."

"I'll see nobody! That satchel's been hooked as sure as you're born, and I can identify it. I know everything in it. There was a night-gown, perfectly new, made of yard-wide goods; there was a bottle of hair refrigerator; there was a night-gown with a hole in the back; there was a——"

At this moment the baggage master came up and informed her that the lost satchel had been found under a pile of trunks, and she arose and remarked:

"Well, that's all right. Looks to me as if there was a little suspicion here, but this railroad wants to understand that I can stic. up for my rights with anybody. I was bound to have that satchel or put the whole caboodle of ye where you couldn't break out."

And parading up and down the depot, with the big satchel under her arm, her eyes wore a look of proud triumph.—*Detroit Free Press.*

RAILROAD LAW.

Liability as Carrier of Animals.

In Evans against the Fitchburg Company, in the Massachusetts Supreme Court, which was an action against a railroad company to recover for injuries done by one of the plaintiff's pair of horses to his mate, while being carried by the defendants, the defendants requested a ruling that if they used due care and provided a suitable car, and the injuries were caused by the peculiar character and propensities of the horses, such as fright or bad temper, they were not liable; the judge refused this ruling, but ruled that if the horse was injured by his mate in an outburst of viciousness, quite unusual in horses worked together, the jury might find for the defendants. *Held*, that the defendants had good ground of exception.

Passenger Required to Show a Ticket.

In the case of Townsend against the New York Central & Hudson River, in the New York Court of Appeals, plaintiff purchased a ticket on defendant's line from S. to R., and took passage on a train which went only a part of the way. The conductor on the train took up and retained the ticket, without giving any check or other evidence of a right to a passage on the next train. Plaintiff took the next train on defendant's line for R., and, when called on for his ticket, informed the conductor that the conductor of the previous train had retained it. The conductor thereupon demanded the fare, and, it being refused, ejected the plaintiff. *Held*, (1) that even if plaintiff was justified in his refusal, he could not recover exemplary damages, but (2) that plaintiff was not justified in such refusal; the wrongful taking of his ticket by the preceding conductor not exonerating him from a compliance with the rule requiring passengers to present a ticket or pay the fare.

OLD AND NEW ROADS.

Boston & Albany.

At the annual meeting in Boston, Feb. 9, Vice-President Lincoln presented a long report on the Ware River lease and other matters. He gave in full the history of that road and its lease to the Boston & Albany, and set forth its absolute necessity in order to prevent a diversion of traffic to other lines. The Ware River road is capable of a considerable development especially in the way of a profitable traffic in milk and dairy products. The lease was arranged without any interference on either side from Mr. Chapin, and if he (Mr. Lincoln) had to arrange the whole matter over again, he would take precisely the same action as he had done except that he might wish to fix the maximum rental at 6 instead of 7 per cent. on the stock.

As to the construction account, the expansion has been less than that of other lines leading into Boston. The charge to construction of the excess of cost of steel over iron rails is founded in reason and is the practice of many well-managed companies. The only absolutely unprofitable expenditure in this line has been the work on the South Boston Flats, which was undertaken at the urgent instance of the Commonwealth and the city of Boston.

As to the charges made against Mr. Kimball of selling gravel to the road while a State director, they are absolutely untrue. Mr. Kimball merely loaned money on the lands. A track was built to the gravel pit, as it would have been built to any other. This track cost $118,901 and in two years the rent paid for its use by contractors amounted to $112,371.

The statement was so full and satisfactory that no further investigation on the part of the stockholders was ordered, and the old board was re-elected by nearly a unanimous vote. A resolution was passed that hereafter passes should only be issued for a consideration, and that a record should be kept of all passes and a report thereof be made to the stockholders annually.

The majority of the State directors have made a report approving highly of the management and condition of the road. It is signed by Charles L. Wood, Louis R. Norton, John Cummings and (with some qualifications) J. H. Chadwick.

The General Passenger and Ticket Agents' Association.

This Association held its semi-annual meeting in Louisville, beginning Feb. 9, and continuing four days. The Committee on Centennial Rates presented a report recommending that the basis of the rates for the Centennial Exposition be as follows: First—Round-trip tickets to New York, good for 30 days, may be sold from Detroit, Toledo, Cleveland, Crestline, Columbus, Cincinnati and at any points west thereof in territories east of Omaha, and at competitive points south of the Ohio River, at a reduction of 25 per cent. from convention rates. Second—Round-trip tickets to Philadelphia, good for 30 days, may be sold from Detroit, Toledo, Cleveland, Crestline, Columbus, Cincinnati and points west thereof in territories east of Omaha and at the competitive points east of the Ohio River at $1 less than round-trip rates to New York. Third—Round-trip tickets to Philadelphia, via New York, good for 30 days, may be sold from Detroit, Cleveland, Toledo, Crestline, Columbus, Cincinnati, and all points west thereof in territories east of Omaha, and at competitive points south of the Ohio River, at $1 more than round-trip rates to New York. Fourth—From territories east of Detroit, Toledo, Cleveland, Crestline, Columbus and Cincinnati, the basis of reduced rates and limit for round-trip tickets shall be fixed by the trunk lines, and from competitive points between trunk lines in said territory to Philadelphia, via New York, shall be $2 more than rates to Philadelphia by direct short lines.

The report was adopted and the necessary resolutions passed. The usual adjustment of regular rates was reported by a committee and adopted, no changes of importance being made.

At the third day's session Mr. Abbott of the Erie Railway announced to the convention of ticket agents that a model American railroad ticket office will be established on the Centennial grounds at Philadelphia by the trunk lines. Every railroad and transportation line in America will be represented at this office and tickets to all parts of the world will be sold at special rates. It was resolved with but four dissenting voices that the issuing of railroad tickets by any firms or individuals organized for the purpose of obtaining transportation rates from railroads and issuing tickets in their own name and operating generally as a recognized transportation company will be no longer tolerated; also that the convention shall cancel existing arrangements between such firms or individuals and railroads represented in the association of ticket agents. It is understood these resolutions refer to what are known as tourists' agencies.

The remaining business consisted of the election of officers and other routine business.

Extensions of Mail Service.

Mail service has been ordered over the extension of the Sigourney Branch of the Chicago, Rock Island & Pacific road, from Sigourney, Ia., to Oskaloosa, 25 miles, to begin Feb. 16.

Erie.

Receiver Jewett reports for December gross receipts from all sources, including $518,171.62 balance from November, amounting to $2,770,488.77, and $2,378,921.52 of expenditures, leaving a balance, Jan. 1, of $391,567.25. The receipts from transportation were $2,186,487 in December.

The aggregate amount of debt certificates and notes issued by the Receiver has been $1,536,539.40. Of this amount there was retired in December $175,000, making $930,000 retired in all, and leaving $606,539.40 outstanding Jan. 1. The cash balance Jan. 1 was $148,035, the rest of the balance of $391,567.25 being represented by accounts and claims not yet audited.

Messrs. Fleming and Miller, the delegates from the Dundee committee of bondholders, and also of the London committee of which Sir Edward Watkins is chairman, have arrived in New York, and had a conference with Mr. Jewett. They purpose making a careful examination of the property for themselves.

There is some talk of a movement among the American stockholders to resist a foreclosure, but it seems to have but it seems to have little foundation. Mr. Russell Sage is reported to have declared his opposition.

Lake Superior & Mississippi.

The plan for the reorganization as perfected by the committee and approved by the bondholders is as follows:

1. The trustees to prosecute proceeding for foreclosure, and the company to facilitate the same, so that a decree may be obtained as economically and expeditiously as possible.

2. The committee of the bondholders to become the purchasers in trust for the parties uniting in the purchase, and a new corporation to be organized for the purpose of acquiring and holding the property.

3. The capital stock of said new corporation to be divided into preferred and common stock.

4. The preferred stock to be issued in paid-up shares of $100 each to the first-mortgage bondholders, for the amount of their bonds and accrued interest to Jan. 1, 1876, which it is hereby agreed shall be liquidated at the rate of $1,200 for each $1,000 bond, and to receive dividends, payable semi-annually, on the first days of July and January of each year, equal to the net income of the company from all sources, but said dividends not to exceed seven per cent. per annum, and to be made payable first out of the net profits of the railroad, and in case of a deficiency therefrom the same to be made up, if possible, out of the net income from stumpage and the sales of lands. When not required to make up the dividends on the preferred stock, the net proceeds from lands and stumpage to be applied, at the expiration of each year (provided the same amount to at least $10,000), to the purchase of the preferred stock. If said stock be below par on the market, proposals to be invited by advertisements in the newspapers of New York, Philadelphia and St. Paul, and if the same cannot be bought at par or under, drawings to be had as is usual in the operation of sinking funds.

5. The preferred stock to be received at par for lands, as the first-mortgage bonds now are.

6. The common stock to be issued in shares of $100 each, to the holders of income bonds, notes, certificates of indebtedness, book accounts, and floating debt, for the amount of their respective claims and accrued interest, to January 1, 1876, and to the holders of the present common stock, at the rate of one share of new stock for twenty of old.

7. The holders of the new common stock to be entitled to dividends out of the balance of the net earnings of the railroad, but not exceeding six per cent. in any one year after the payment of seven per cent. on the then outstanding preferred stock; any surplus of net earnings to be used in purchase of preferred stock.

8. Each share of preferred stock, and every three shares of common stock, to be entitled to one vote at all meetings of the company.

9. No mortgage to be placed on the property without the written consent of the holders of not less than two-thirds of the preferred stock then outstanding, and one-half of the common stock.

10. The conditional deed heretofore made with the Northern Pacific Railroad Company, for one-half of the railroad between the Northern Pacific Junction and Duluth, shall be confirmed upon the payment or surrender of the notes given that company for interest paid by them, and the further payment by them of the balance of the consideration, according to the terms of said deed, or upon such terms as shall be agreed upon by the committee of the board of directors of the new company.

11. The expenses of the sale and reorganization, and the claims of all persons for labor and material furnished the company within six months previous to the transfer to the new organization, shall be considered prior liens upon the property and be first paid from the receipts of the company.

12. The agreement with the Northwestern Equipment Trust, of Philadelphia, for the use of locomotives and cars, by which the company becomes the owners of the equipment under the conditions therein named, shall be continued and carried out by the new organization.

13. The lease of the Stillwater and St. Paul railroad, at an annual rental of $20,000 in currency, shall be continued and confirmed; the certificates given for the funded coupons to be paid preferred stock.

14. The branch railroad from N. P. Junction to Knife Falls may be built by the new company from the first net receipts of the railroad; but the amounts so appropriated shall be divided among the preferred stockholders from the first surplus receipts of the railroad, after paying seven per cent. dividends in in any year on the preferred stock.

Alabama & Chattanooga.

The new trustees are now in full possession. Colonel Ball, the new General Superintendent, is making a careful examination of the property with a view of determining what is needed to put it in good condition. It is understood that the new owners are willing to spend sufficient to put the road in repair and provide needed equipment.

A brief statement of the present condition of affairs may serve to make matters plainer to those who have not followed the very intricate course of the long litigation. The road was sold under a decree of foreclosure and bid in by the trustees, under orders of Court, for $1,200,000, for the benefit of such of the first-mortgage bondholders as would come in and accept the bid by filing their bonds and overdue coupons in Court by Jan. 11, 1876. This was done by holders of over $3,500,000 bonds. The recent argument was as to the admissibility of certain debts contracted by former receivers, and the final decree lately granted gave the road, subject to the costs of court and the receiver's debts so far as approved by the court to these bondholders and to such other first mortgage bondholders as would come and join with them by filing their bonds and coupons in Court by June 15, 1876. Only $1,200,000 in bonds and overdue coupons, or of either, will have to be actually applied in payment of the bid. The residue not used in paying for the bid will be returned to the bondholders, and will stand as a debt against the State of Alabama as endorser. All the first mortgage bonds not paid into Court, numbered below 4,720, will be entitled to their *pro rata* of the $1,000,000 received from the State, as will also the residue of bonds and coupons not consumed in paying the bid. The high-numbered bonds—that is to say, the bonds numbered above 4,720 and known as the fraudulent issue—are allowed as to the first mortgage, but, owing to the doubtful phraseology of the agreement of settlement between the State Commissioners and the bondholders, it is uncertain whether they will receive any part of the amount to be paid by the State.

It is not yet determined what amount each bond will have to be assessed for the expenses of the litigation, etc. Meantime, bondholders joining in the purchase are expected to make a small cash deposit, to meet current expenses.

Albert.

The grading of this road is well advanced and the bridge work is also in quite a forward condition. The winter has been unusually favorable for the work and there is little doubt that the line will be ready for the rails by midsummer. It is to be about 35 miles long, from the Intercolonial at Salisbury, N. B., southeast by the Albert coal mines to Shepody Bay near Hopewell.

Ontario Railroad Subsidies.

The Ontario Government has divided the railroads which are to receive subsidies from the Province into four classes, as follows:

1. Lines not before aided, which includes the following:
Lake Simcoe Junction, 26½ miles, at $2,000 per mile.
Belleville & North Hastings, 22 miles, at $3,000 per mile.
Cobourg, Peterboro & Marmora, 18 miles, at $2,000 per mile.
Credit Valley, 80 miles, at $2,000 per mile.
Port Dover & Lake Huron, 25 miles, at $2,000 per mile.
Making a total of 166½ miles, and of $355,000 of aid.

2. Lines to which aid has already been granted and which are now to have additional assistance to the amount of $123,500, as follows:
Victoria, 33 miles at $1,000 per mile.
Montreal & City of Ottawa, 66 miles at $1,000 per mile.
Midland, 14 miles at $1,750 per mile.

3. The third class consists of roads to which grants were formerly made, but which failed to comply with the terms. To these new grants are made, as follows:
Grand Junction, 45 miles at $1,000. The former grant was $42,000.
Kingston & Pembroke, 16 miles at $3,750 per mile. The former grant was for $217,750, being $3,250 per mile for 67 miles.

4. This class includes entirely new lines, of which there is but one.
Pacific Junction, 80 miles, at $6,000 per mile.

The total amount granted to all the classes is $1,223,500 for 420½ miles of road.

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CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

CONTENTS.

Editorial Announcements.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

THE SEVENTH MASSACHUSETTS REPORT.

The seventh report of the Massachusetts Railroad Commissioners contains a great deal of matter of general public interest, even the questions discussed concerning special Massachusetts railroad questions being for the most part of widespread application. The brief summary of the results of the year in construction and working occupies but little space. A discussion of accidents and their causes is extended to the accidents of the United States, as reported in our monthly record, as well as to those of Massachusetts railroads, the more important of the latter being reported upon separately at some length, much as is done by the inspectors of the British Board of Trade. A chapter on "Railroad Accounts and Returns" is certainly of as much importance out of Massachusetts as in it, and is likely, we suppose, to lead to some decided action in more States than one. A long discussion of the affairs of the unfortunate Eastern Railroad is not only appropriate to the time, but serves admirably to give point to the chapter on accounts and returns. There is an interesting discussion on "Workingmen's Trains," which exist now on three Boston railroads; and perhaps the most valuable of all is the closing section on "The Freight Competition of 1875."

The record of the work of the year in Massachusetts (the year ending with September, 1875,) shows 47¼ miles of new railroad completed. The companies reporting to the Commission had 2,459½ miles of road, in main line and branches, with 693¼ miles of sidings and 626 miles of sidings—3,788¼ miles of track; of this there were within the limits of Massachusetts 1,816¾ of main line and branches, 505 miles of sidings and 440 of double track—2,761¼ miles of track in all, which is at the rate of one mile of road (not track) to 429 square miles of territory and 909 inhabitants. The number of corporations was 63. The average cost of road and equipment was $64,657. The companies have outstanding $118,261,286 of stock and $53,355,053 in funded and floating debts. There was an increase of 1 per cent. in the stock and of 9 per cent. in the debt during the year, amounting to 3.5 per cent. in the aggregate of stock and debts, the increase in length of road meanwhile having been 1.6 per cent. and in length of track 2.4 per cent. The earnings were on the average $13,251 per mile; 51 per cent. from passengers and 44 per cent. from freight—a proportion much like that of English railroads. The total earnings 5.9 per cent. less than the previous year, freight earnings having fallen off nearly 10 per cent. and passenger earnings 2.4 per cent. The working expenses were 70 per cent. of the receipts, and 4.1 per cent. less than the previous year, leaving average net earnings of $3,975 per mile of road against $4,425 in 1874. These net earnings were equivalent to 5.7 per cent. on the total capital invested, against 6.4 per cent. the previous year. Thirteen companies had no net income; twenty, with nearly 60 per cent. of the total capital, had from 5½ to 11½ per cent. income. Twenty-six of the 63 companies paid dividends on their stock, varying from 1 to 10 per cent., against 30 in 1874; 27, with $37,000,000 of stock, paid no dividend in 1875; less than 7 per cent. was paid by 13 companies on $9,443,000; 7 to 10 per cent. by 13 companies on $68,959,000, and on $40,000,000 of this latter 10 per cent. was paid. The interest paid was at the rate of $1,282 per mile and the average rate of interest was about 7 per cent.

The work of the year was less than that of the previous year, though nearly the same effort was expended in performing it. That is, the train-mileage was nearly the same, there being an increase of but 0.1 per cent. There was an increase of 2.6 per cent. in passenger-train mileage, balanced by a decrease of 1 per cent. in freight-train and 14 per cent. in service-train mileage. Passenger traffic (the number carried one mile) fell off 3.9 per cent.; freight traffic 2.9 per cent. The absolute bulk of traffic for the two years was, per mile of road:

	1875.	1874.	Decrease.	P.c.
Passenger mileage	261,770	266,508	15,262	5.8
Tonnage mileage	246,730	236,126	10,604	4.5

The average train-load was 64.5 passengers or 63 tons of freight in 1875, and 69 passengers or 64.2 tons of freight in 1874.

The average receipt per passenger per mile during the last year was 2.336 cents, and the average expense 1.709 cents; the average receipt per ton per mile was 2.453 cents, the average expense 1.856 cents. The freight rates and expenses are larger than in most other thickly peopled States, and this is probably due largely to the small average loads and the short hauls incident to a manufacturing business.

Steel rails formed 34 per cent. of the total track in 1875, against 29 per cent. in 1874, 156 miles of steel having been laid during the year. The increase in rolling stock was 1.55 per cent. in locomotives, 5 per cent in passenger cars, and 5 per cent. in freight cars. Train-brakes are now applied to nine-tenths of all the passenger cars. There is one station for every 2.14 miles of road. Six passengers were injured, but none killed by causes beyond their own control during the year.

The part of the report entitled "Railroad Accounts and Returns" repeats the statement of last year that the returns made by the companies to the Commissioner are essentially untrustworthy, and must continue to be so until the companies are made to keep their books—not merely make their returns—on a uniform system. The adoption by each company of a system of its own, which moreover it may change from year to year to suit itself, or its managing officers, makes it impossible to say whether the same things are included under the same heads in the reports of different companies, or even whether the same things are included under the same heads in the reports of a single company for different years; and this makes it impossible to ascertain definitely the condition of any company's affairs from its returns unless the examiner is familiar with the principles followed up in making up each special return. Some companies charge to construction what others would put under working expenses, and thus very different statements of cost of road and net earnings are produced, and with perfect honesty of purpose misleading statements of condition may be rendered; while where there is any desire to deceive, the way is perfectly easy. The result is that a company on the verge of bankruptcy may be made to appear to be accumulating large profits, and the proprietors themselves and all intending purchasers of its securities are deceived by the only practical means available for forming a judgment of its value. The Commissioners illustrate the different methods of charging expenses by the varying cost per train-mile—reported for the last year at amounts varying from 60½ cents on the Springfield, Athol & Northeastern Railroad to $1.41¾ on the Boston & Providence. Where what are properly construction expenses are charged to expense, the cost per train-mile is unduly exaggerated; on the other hand, where what are properly working expenses are charged to construction, this cost is reported too small. The average on six leading Massachusetts roads was $1.106, and it is notable that all those roads which report a much smaller expense are financially weak. We doubt whether the report takes sufficient account of the actual varying expense per train-mile; for instance, the average passenger train-load as reported for 16 roads varies from 20 to 94 persons, and the average freight train-load from 34 to 83 tons, and though the expenses by no means vary with the loads, yet this and many other circumstances may cause the cost to vary Still, the fact remains that the accounts as kept do permit enormous variations under the same circumstances, and do not necessarily give a key to the cost of the roads or the cost of working them. More glaring are the differences in the reported cost of rolling stock. Some companies charge the cost of construction of new cars and engines to expenses, some the cost of renewing old ones to construction; the result is that the average cost of locomotives appears from their returns to vary from $2,507 on the Boston & Providence to $12,565 on the New Haven & Northampton; the cost of passenger cars from *ninety-six* dollars on the Fitchburg to $4,500 on the Eastern; and the cost of freight cars from $57 on the Norwich & Worcester to $868 on the New Haven & Northampton. Some companies keep no account of the free passes issued and the traveling done on them, thus reducing the total passenger mileage and increasing the average receipt per mile returned in their reports. Bad debts, discounts, interest and unusual losses are sometimes charged to capital account.

This portion of the report is followed by a sketch of the history of the Eastern Railroad and the tangled condition of its affairs, which is extremely interesting and timely. The main sources of its troubles the Commissioners find to have been an unreasonable zeal in securing exclusive connections at whatever cost, such connections usually bringing the road little or no profit, while loading it with obligations, and apparently an almost total ignorance of the affairs of the company by all but one of its directors, that one himself being apparently hopelessly confused in the midst of his own transactions, largely the result of a method of accounting which afforded no means of obtaining a clear general view of the company's affairs. Though the Commissioners think that some transactions of the managers of late years need a searching examination, they say that nothing has come to their knowledge directly affecting the integrity of any one intrusted with the management. "At the same time the lack of system, the irregular methods of doing business, the extraordinary assumptions of authority and absence of accountability everywhere apparent cannot but excite notice."

With regard to workingmen's trains, the report chronicles a slight decrease in the number carried on the Eastern Railroad, where such a train has been running for three years; but it had an average load of about 400, and the receipts were at the rate of about $1.60 per train-mile. Assuming, as the Commissioners do, that the average expense was not greater than for the average passenger train on the Boston roads, this left a profit about the same as on the average Massachusetts railroad business. This, however, is a very unsafe assumption. It is safe to say that some of the expenses of a train-load of 400 passengers will be materially greater than those of an average train-load of 65. Whether there are savings to balance or more than balance this can only be known by a special account of this train's expenses, which we have never seen given. But so far we think that no sufficient evidence has been given that this Eastern five-cent train is the "indisputable and rather surprising success" that the Commissioners call it. The Old Colony Railroad began running a cheap train for 7¾ miles (15 tickets for a dollar) last June. Down to December the receipts had been at the rate of 34 cents per train mile; the Boston & Maine, with great unwillingness, put on a similar train for 12½ miles on the first of October, and in two months the average receipts had been 42½ cents per mile. It is true, as the report says, that nothing can be proved by the results of a few months; probably at least two years are needed to show whether a traffic can be developed; but we venture to suggest that the best way to destroy the possibility of success of such trains is to have them on all the roads. The first condition of their success is the concentration of a very large traffic on a single line and a single train, and in few cities is this possible on more than one or two railroads.

The last part of the report, on "The Freight Competition of 1875," will have the greatest interest for the public at large, and is notable from the acknowledgement that the public interests are not served by a wasteful war of competition, and that probably they would be served by a combination of common carriers which would concentrate responsibility as well as authority.

The statistics of this report are probably the most exact and valuable published by any State, owing to the supervision of the returns exercised by the Board. But we find in a cursory examination some defects which are probably chargeable to the dilatoriness of some of the corporations reporting. The summary of the returns given in the introduction to the report does not correspond with some of the figures in the abstracts of returns, and neither with the convenient and compact summary following the abstract on pages 182 and 183. The summary seems to include all the returns, the abstract to omit a few figures, and the introduction to omit still more, some of them important, such as the statement of freight train mileage nearly a tenth too small. This is especially unfortunate because this part of the report will be that most copied by

the State newspapers, and is doubtless intended to give a clear, easily read and understood sketch of the work of the year.

Generally, we may say that the report is, as heretofore, very valuable and suggestive, and perhaps the most interesting piece of railroad literature issued. It is not only worth reading, but easy to read, and we hope that railroad men will give it the attention which it deserves.

DISCRIMINATIONS AGAINST CHICAGO.

Most of this winter Chicago dealers in grain and flour and some other produce have complained of the freight rates from their city to Atlantic ports. In this case the comp aint was not so much that the Chicago rates were too high as that the rates from neighboring towns were too low. There was a discrimination against Chicago, they affirmed, and they set about in a sensible way to investigate the matter. A committee of the Board of Trade, a powerful organization, was appointed to collect evidence and to report as to the facts and the proper measures to be taken in view of them. This committee held sessions for several days, asked evidence not from shippers only but from representatives of the railroads, and last week presented a report. It found that the recent combination of the trunk lines had succeeded perfectly in maintaining rates so far as Chicago is concerned; reductions could not be had on shipments thence either directly or indirectly. But at points north and south, and especially south, either the regular rate was lower in proportion than the Chicago rate, or else the regular rate was not maintained, and the differences were such that grain which under ordinary circumstances would be shipped by way of Chicago was attracted to other routes. A great deal of complaint was made because the trunk lines carry from Milwaukee as cheaply as from Chicago, 85 miles nearer New York by the all-rail routes, and further because shipments of grain from Milwaukee are taken across Lake Michigan and thence by rail to New York for 37½ cents, while the Chicago rate is 45 cents.

Probably no city in the West has, on the whole, less reason than Chicago to complain of discriminations. Most discriminations in Western rates are made in favor of Chicago, for the natural reason that every possible reduction has to be made in order to divert traffic from the lake and canal route —the cheapest interior route in the country and perhaps in the world. But this does not in any way lessen the effect of a change in the proportion of the Chicago rate to that of other competing towns. And the chief sufferers are probably the Chicago railroads—that is, the railroads from Chicago westward—rather than the Chicago merchants. It is of course for the interest of these railroads to have all the produce shipments made by way of Chicago. The cheap lake rates determine such a movement when navigation is open; but when it is closed it is the relative costliness of the different all rail routes to the East that determines the direction of shipments. For the country due west of Chicago and all further north, the route through Chicago to the East is the shortest, or at least as short as any, though the lake and rail route by way of Grand Haven is shorter for roads from Milwaukee westward. But for most of the country south of Chicago the rail route by way of that city to New York, Philadelphia and Baltimore, and especially to the two latter cities, is indirect. This made little difference a few years ago, for then there were but few east-and-west roads crossing the country south of Chicago. Now Illinois is gridironed with them, and they for the most part supply to the stations on their lines the shortest routes to the Atlantic seaboard, which, however, has not prevented most of them from becoming bankrupt. In the summer, these roads can hardly compete with the lake route (unless lake rates are very high, as in 1872), except at rates netting a loss; in the winter they are more nearly on an equality, but still produce tends to go to Chicago, which is the nearest great market, and where it may be stored until navigation opens if rail rates do not permit it to be shipped advantageously. But this is often the only possible harvest season of the east-and-west roads, and naturally they use every effort to attract shipments, and among them such reductions of rates as are within their power.

Now these railroads have their connections with the trunk lines which have combined to maintain rates at some distance east of Chicago, where the rates to New York would naturally be lower than from Chicago. So by reductions made on their own lines solely they have often been able to compete successfully with the roads to Chicago which they cross. Indeed, in the case of the Chicago roads which extend most nearly due southward, the cross road usually forms the hypothenuse of a right-angled triangle of which the road to Chicago and that from Chicago to New York are the two legs, and a considerable reduction in the rate per mile is necessary to make freight go by way of Chicago. There is a constant tendency for freight to turn from the north-and-south roads to these cross lines, which the former resist by increasing rates to crossing points and reducing them to Chicago, but which cannot be overcome wholly unless the Chicago rate is considerably lower than that to the crossing point.

The investigation seems to have established the fact that the combination had not been able to maintain rates to points south of Chicago as it had to Chicago; it was charged that the trunk lines were accepting their proportion of the reduced rates from the southern points, though no proof was given, and the measures recommended by the committee were the establishment of a water line of steamboats across Lake Michigan to Grand Haven, as a set-off to the Milwaukee line; the securing of the construction of the short section of railroad between Flint and Lansing to complete the Chicago & Lake Huron road as an independent Chicago connection with the Grand Trunk; and further and chiefly it recommended a union of shippers for mutual protection, with a committee to hear grievances and take measures for securing justice.

There is probably not one of the grievances complained of that the cities competing with Chicago have not suffered from more than Chicago, and the pretense that there was a systematic effort on the part of carriers to divert traffic from Chicago is ridiculous. The low rates to towns south of Chicago, however, are unfavorable to the trunk lines, or to most of them, as well as to Chicago, and in their own interest they should desire to prevent them. That is, it is useless to maintain a reasonably profitable rate to one place, usually the chief center of traffic, if this traffic is diverted to other points by lower rates. Still the railroad companies cannot be held bound to prevent any diversion of traffic by reason of the competition of other routes. For then the question is whether they will lose more by the diversion of a certain proportion of their traffic than by the reduction or total destruction of their profits on all traffic, and the possible permanent diversion of some traffic from a part or the whole of their line. The latter is a matter of importance. It is, on the whole, usually advantageous for a route that the prevailing course of its traffic should not be disturbed, and on this account sacrifices are sometimes justifiable to prevent the temporary diversion of business.

In this case, action was had almost immediately by the Western railroad companies, which were wise to give heed openly to manifestations of dissatisfaction so authoritatively made, and a new tariff has been made, which differs chiefly from the old one by making the Peoria rate five cents higher than the Chicago rate, instead of the same, as formerly, and reducing the difference between the Chicago and the Indianapolis rate from 5 to 4 cents. Perhaps more important than any changes of nominal rates is the determination expressed that the rates made will be exacted, inflexibly, on traffic from connecting roads. The east-and-west roads south of Chicago are doubtless opposed to this action; but they are not in condition to stand a contest, and the other lines might easily have made it impossible for them to make another dollar of profit this winter, and they doubtless prefer to carry a little at a profit to carrying a great deal at a loss, which may have been the alternative.

Helps to Travelers.

The *Nation* recently called attention to a huge map of the United States painted on the wall of the Wells, Fargo & Co. Express office in New York, and suggested that the railroad companies of the country would do well to imitate it at their stations, and it notes that in Brazil the law requires the railroad companies to keep posted at their stations certain geographical information concerning the vicinity. We commend this matter to the attention of our railroads. It cannot be too steadily held in mind that the patrons of a railroad are usually strangers to all places on the line but one or two, and in great part strange to the station where they leave the road. There is hardly anything that is so useful to the strange traveler as precise information of locations and distances in the neighborhood where he is to make a longer or shorter stay. Our passenger men are not unfamiliar with map-making, though it is usually of a fearful and wonderful kind, devoted largely to the conveyance of misinformation; but the honest and really useful maps which they use are almost exclusively of long routes, intended to aid the traveler in selecting from two or more available railroads. This is all well enough; and a great map at the terminal stations, showing the whole road, and nothing very minutely off the line of the road, is perhaps sufficient there. But it is not enough at the way-stations. There the traveler will often be greatly assisted by a map on a large scale of the surrounding country, as well as of the town or city itself. Most counties of the more populous states have been mapped on a scale large enough to show all the roads and farms—an inch and a half or two inches to the mile. These serve the purpose very well, and if one were kept accessible in every station in the country mapped, it would be extremely convenient. It might be necessary to put it under glass to prevent its early defacement and destruction; but that is not impracticable, and as such maps usually do not cost more than five or six dollars, the expense is not prohibitive.

But besides maps, there is other information which travelers would find very convenient at stations. The hotels generally take pains to announce themselves, but it might be well to have their names posted, with their distances and directions from the station; and so with livery stables, and other information as to available means of transportation into the country and within the town.

We have often felt inclined to recommend the preparation of special railroad guides, giving this and much other local information, devoted to a single road, and aiming to give definite information of the places on that road. It is much better to give the traveler his information while he is on the train if it is possible. He is then eager to learn, and has leisure to learn—is in the condition best fitted to receive information concerning the country he is traveling through, and especially concerning the station he is to visit. Were it practicable to have a map of the road the whole length of the car, it would probably be severely studied by nearly all passengers capable of understanding it, and would prove of immense advantage. Unfortunately there is hardly wall room enough in a car to put up a map big enough to be of any use; but it would not be impossible to make a long rolled or folded map, showing the country on a pretty large scale for eight or ten miles on each side of the road, and accompanied by a guide book containing the information which the traveller is likely to need at any station where he may stop—only this, or this in addition to the historical or descriptive matter which serves chiefly to interest the traveller in the country through which he passes. Such a guide book, carefully compiled and corrected yearly, ought to be salable at something more than cost price to travellers, and indeed might be made almost invaluable to nearly all business men and interesting to the entire population throughout the length of the road. It need not be large, but it should be systematically arranged, so that any given fact or class of facts can be found as readily as a word in a dictionary.

Let us suppose, for instance, a little station in Iowa or Kansas. We might put our information in this shape:

CHESTER, Brown County, 177 miles from (terminus). Population (census of 1875) 904.

Post Office—¼ mile from depot on Main street (3 blocks west and 7 blocks north).

Hotels.—Centennial House, opposite depot; *American*, ⅛ mile from depot (due north on Bluff street); *Squatter's*, 1¼ miles from depot, in the western part of town on Virgil road.

Livery Stables.—At American House, and at Holt & Barrows, back of post-office.

Stage Lines.—To *Virgil*, 27 miles south, from American House, daily; to *Clearwater*, 42 miles northeast, Mondays, Wednesdays and Saturdays, from American House. Weekly mail to *Hill's Corners* takes passengers. Starts from post-office.

Roads and Distances.—Virgil road extends southward, Blackman's Tavern, 11 miles; Clifford P. O., 18 miles; Virgil, 27 miles, thence southward to Chace on A. & B. RR., 50 miles from Virgil.

Wyandotte road extends southwestward, etc.

Harper road extends westward, etc.

Andover road extends north by west along the bank of *Green River*, etc.

Land Agents.—[This for a new country where a considerable proportion of the passengers arriving are immigrants looking for farms.]

Business.—The chief shipments from Chester are wheat, corn and hogs, besides some hops. There are four dry goods and general stores, one drug and book store, one clothing store, two shoemakers, wagon shop, blacksmiths, four lawyers, four doctors, a Methodist, a Congregationalist and a Roman Catholic church, a graded school with four teachers.

We do not by any means give this as a model, either as to the extent of the information or the manner of presenting it but only as suggesting something of the kind of information needed by travelers, and not always easy for them to get.

In such attempts to supply local information to the stranger (and such as that above can be posted at a station as well as printed in a guide book), there is always danger of giving too much and burying what he really needs in a mass of matter which, to him, is rather curious than necessary. Nothing can be made too plain. It is the ignorant that are most likely to need help, and the least opportunity possible should be given for misunderstanding anything.

If we are asked now how a railroad company will get its money back for doing this kind of work, we fear we cannot answer very definitely. The chief reason for doing it is that the passengers need to have it done, and there is apparently no one who finds it his business to do it. But there are some advantages apparent. The guide-book, it would seem, might pay for itself, and the information at stations need not be very costly, and ought at least to save the station master a great deal of vexatious questioning when he ought to be at work. Moreover, it is possible, perhaps, that passengers travelling on a road where they found their peculiar needs of this kind attended to thoughtfully would form a favorable opinion of it and preserve a good will which might be profitable to the road and certainly would be very pleasant to its officers and other employes.

Foreign Railroad Notes.

In England, in a suit against the London & Northwestern Railway Company, the Master of the Rolls granted an injunction forbidding the company's manufacturing rolling stock to sell or lease or for any other road than its own or one of its branches. The only exceptions made were that "in an extraordinary emergency" it might lend its rolling stock to another company and, occasionally, to contractors at work on its own line, and to proprietors of collieries and other works in connection with its lines.

A correspondent of the *Railway News* gives the following list of charges for first-class passage for 100 miles on the lines out of London. The amounts are reduced to the equivalents in American gold. Adding about one-eighth will give the equivalents in currency:

	By express.	By ordinary trains.
Southeastern	$7 05	$6 45
London, Chatham & Dover	5 84	5 84
London & Brighton	5 84	4 79
Great Western	5 35	4 29
Southwestern	5 11	5 11
Great Eastern	4 87	4 87
London & Northwestern	3 76	3 76
Great Northern	3 76	3 76
Midland	3 27	3 27

Sir Edward Watkin, in his speech at the meeting of shareholders of the Metropolitan (London underground) Railway,

paid 13.3 per cent. of the passengers were first-class, 20 per cent. second-class and the rest—two thirds of the whole—third class.

Heretofore on French railroads, when a passenger had bought a ticket for a train, he was shut up in a waiting-room and not permitted to leave it till his train arrived, when he was duly guided to his car, on the principle that he would be sure to go wrong if not made to go right. On the Northern Railroad of France this has been changed by a recent order, which reads as follows:

"Henceforth, in all the stations of this company, access to the departure platforms shall be free to all passengers *provided with tickets*. The stay of the passengers in the waiting-rooms will be optional with themselves. On this account the closing of the doors connecting the waiting-rooms with the departure platforms shall be modified, so that the doors may be opened or closed at the pleasure of the passengers.

"At junction stations, to direct travelers as to the choice of the trains they must take, a sign shall indicate the destination of every departing train. Moreover, when there is need, the station-master will have the brakemen announce in each car compartment, in an ordinary tone of voice, before the train leaves, the principal stations at which the train stops.

"Deafening cries annoying to passengers now customary at the junction stations for announcing to passengers of different destinations what they have to do are forbidden."

Public trials have been made on a Paris street railroad of a compressed air motor for street cars, and also of the fireless locomotive, and have attracted a great deal of interest. In Belgium also the subject is mooted.

The John Cockerill Company of Seraing, Belgium, put in a new train of rolls for rails which began rolling about the 1st of December last. The second week in January this mill turned out 943 tons of rails, and it was expected that it would be made to do still better. The best day's work was Jan. 1, when 416 rails were rolled during the day and 425 during the night, or 821 rails in 24 hours, of the pattern used by the Belgian State railroads, weighing 77 lbs. per yard. A Belgian paper says: "As we see, the results of the American works making 200 tons per day are almost equalled."

The Belgian *Moniteur des Interets Materiels* publishes a table of the loans issued in 1875, showing a total of $340,899,000 against $842,000,000 in 1874 and $2,019,000,000 in 1873. Of the total in 1875 $93,490,000 was borrowed by cities and nations, $84,000,000 by banking establishments, and the balance of $163,490,000 for railroads and various industries. Of the total, America is credited with taking $44,000,000, $37,000,000 for State and city loans and the rest for railroads, etc.

The Prussian Minister of Commerce, Manufactures and Public Works has sent to all Government railroad managements the report given by the London *Times* of the great trial of continuous brakes on the Midland Railway last June, in which the Westinghouse brake was extraordinarily efficient. The Minister directs the special attention of the railroad administrations to this matter, and says that a similar trial of brakes used on Prussian railroads will be ordered at a suitable time.

The Prussian Minister of Commerce has recently issued an order that hereafter no mechanics may be appointed as foremen of shops and masters of machinery on the State railroads unless they have enjoyed an academical education.

The Austrian Minister of Commerce has approved a new form for railroad statistics which had been adopted unanimously by the representatives of the Austrian and Hungarian railroads, and the returns for the year 1876 and thereafter are to be made on that form, which was designed by the Hungarian statistician, Keleti.

In the Kingdom of Saxony in 1875 thirteen new railroads were opened, having a total length of 284 miles. Two of these new roads were built by the State; the other by corporations.

The Austrian Government has withdrawn a scheme for new maximum freight tariffs proposed about a year ago, and presented a new one, according to which the maximum rates are to be: Express freight, 11.5 cents (gold) per ton per mile; first-class freight, 4.6 cents; second-class, 3.9 cents; car-load freights of Class A (including grain, iron, etc.), 3.55 cents per ton per mile for distances up to 62 miles (100 kilometres), 3.2 cents up to 124 miles, and 2.5 cents for distances exceeding 124 miles. Freights of Class B, which must be shipped in quantities of at least 22,000 lbs., will be limited to charges amounting to 2.84 cents per ton per mile up to 62 miles, 2.5 cents up to 124 miles, and 1.78 cents for greater distances. For Class C the rates proposed are 2.5, 1.78 and 1.06 cents per ton per mile for the different distances, while for coal there is a special tariff of 1.78, 1.42 and 1.06 cents per ton per mile. The more important grades are to be calculated as adding to the length of the roads according to fixed proportions. Eight companies are to be required to adopt this tariff as soon as it becomes a law; on thirteen others its application is to be postponed. All the Austrian railroads are to be required to adopt a uniform classification of freight, however.

Steinmann-Bucher, of Zurich, contributes to the Swiss railroad journal *Die Eisenbahn* a paper on the responsibility of railroad employes for the effects of their neglect or disobedience, by which it appears that in Europe employes often give security that they will pay for such loss or damage, and that some companies even exact more than the value of the objects lost or damaged. The writer concludes that the execution of such regulations is usually one-sided and imperfect for the want of a disinterested tribunal to pass judgment on the separate cases, and suggests that the companies should establish a species of court to pass judgment on each charge against an officer or employe. Such a body, he says, could be composed partly of officers of the central management and partly of men from that branch of the service in which the case under consideration arises. This he thinks would secure greater justice on one side and a greater confidence on the part of those subject to trial. He sets down these as general principles limiting the imposition of punishment.

"1. An employe cannot be held responsible for a fault in his service when it is the consequence of over-exertion, bodily or mental, and exhaustion in the service.

"2. An employe cannot be held responsible for a fault when it is the consequence of his being entrusted with so great a variety of business that it cannot be managed by a careful and prudent employe, in the ordinary acceptance of the term.

"3. No employe can be made responsible for a method of performing his duties such as has been tolerated knowingly on the part of his superiors.

"4. An employe to whom is entrusted duties which in their nature require long practice cannot—so long he performs these duties in good faith—be made responsible for errors, if the latter are consequences of insufficient practice or lack of skill in the duties aforesaid.

"5. For faults which were committed chiefly for the purpose of preventing a greater fault or for avoiding an accident, no employe is punishable, if the greater fault or the accident could not be avoided without proceeding contrary to the rules of the service."

The movement for the purchase of the railroads of Germany by the Empire seems to have dwindled to somewhat ridiculous proportions. It is now reported that the Imperial Government will only attempt to acquire the Prussian State railroads—not all the Prussian railroads, but only those now owned by the Kingdom of Prussia. This is much as if the United States, after setting out to acquire the whole transportation system of the nation, should finally content itself with measures for the purchase of the canals owned by the State of New York. There are some in Germany, however, who think that this step will be followed by the acquisition of the Prussian private railroads, and so on. There are great difficulties in the way, however. Some of the States have constructed railroads by which they endeavor to turn through their borders a portion of the traffic between Southern Europe and the North Sea, etc., and they will be displeased to have a body of which they form a part working in competition with them. The military element has been counted as strongly in favor of centralization of the railroads in the hands of the Empire; but there have been some positive expressions from the army in opposition. Unity in the working of the roads in time of war is desired; but it is feared that if railroads should be removed from the field of private enterprise, there would be a great falling off in the work of extension.

Responsibility for Negotiating Bonds.

Baring Brothers, the eminent London bankers, for many years and until recently the bankers of the United States Government, not very long ago specially recommended as an investment the sterling bonds of the Eastern Railroad Company of Massachusetts, and sold £600,000 of them. Now, the company being unable to pay interest, the firm has issued a circular giving notice that it will pay full interest on the bonds issued through its house, said interest being due in March and September. We do not know that there has ever been a similar instance in the history of bond negotiations. It is of course impossible that a banking house should absolutely guarantee all the bonds that it may sell or recommend; but there are cases where a firm with a strong sense of honor might well feel impelled to do as the Barings have done, even at a similar cost of $180,000 a year, and one of these is when it has recommended bonds without particularly examining into the security, depending on the general reputation of the corporation, just as most investors, for want of ability or opportunity to investigate, must depend upon the general reputation of the parties who negotiate and recommend the securities which they buy. It is not difficult to suppose that this may have been the case with the Eastern bonds sold by the Barings. The company had a good reputation, had recently been paying 8 per cent. dividends, had a growing traffic, and enjoyed an exceptional reputation as a well worked road—well worked we mean in the sense of doing work of an exceptionally good quality, which is the phase of working which most interests the non-investing but traveling and shipping public. Hardly any one before last year seemed to suspect that the company could become embarrassed; yet a careful examination of the property and of its yearly reports for a series of years would probably have made it plain that its affairs were not promising. Now, it is just such an examination that every banking house is morally bound to make before recommending an issue of bonds to its customers. If it makes such an examination and recommends on the strength of the result, then, though the judgment should prove mistaken or the issue unfortunate through unforeseen circumstances, the negotiators escape with clean hands and consciences, suffering, if they suffered at all, only in the popular opinion of their skill in judging of investments of that particular kind; but if there is failure after recommendation without examination, especially when an examination would have prevented a recommendation, then the negotiators deservedly suffer in their reputation for honesty, on which their business chiefly depends. Certainly the Barings have taken the most effectual means of proving that they have acted honestly in regard to these Eastern bonds, even if they were mistaken or negligent, and doubtless this action of theirs will add greatly to their already wide reputation as honorable bankers, worthy of perfect confidence. It is in strong contrast to the action of some German (not to say American) firms, which recommended highly issues which they must have known to be unsafe if they knew anything of them, and after interest payments had been suspended actually served as agents of the corporations in efforts to prevent their customers (virtually their victims) from realizing as early and fully as possible on the insufficient security given them. It is to be hoped that each kind of bankers may have its proper reward.

Ventilation of Horse Cars.

Some of the cars on the line which runs through East Broadway, Clinton street, First Avenue and Avenue B in New York have a very simple form of ventilator, which, it is believed, is the most effective arrangement for that purpose ever devised. The ventilators over the door, instead of having ordinary glazed sashes have inclined slats of glass arranged like those of a Venetian blind. These are fixed in the frame of the opening and cannot be moved. The result is that there are always apertures for the admission of pure air in the front end of the car, and others for the escape of that which has become vitiated at the rear end, so that the motion of the car produces a constant current of fresh air through it. The slats incline upward from the outside to the inside, so that the stream of air which enters is directed upward and is distributed through the cars before it comes in contact with the passengers, and thus they are not exposed to a draft, of which mankind all seem—and, perhaps, justly so—to feel a deadly apprehension. The inclination of the slats also prevents snow and rain from entering the cars through the openings of the ventilators.

It would be an improvement, we think, to substitute wooden slats for the fragile glass, which is, of course, very liable to be broken. The wood would also have the advantage that the anti-fresh-air man would not observe that the ventilator was open, and thus, those of us who can and do smell the vile odors and breathe the foul air could have a chance of getting a supply of oxygen.

The simple device of substituting open slats instead of glazed sashes in the ventilators over the doors would, it is believed, do more to remedy the evil of bad ventilation of horse cars than all the patented traps ever devised. Its very simplicity, however, is apt to cause it to be overlooked. It is commended to the managers of horse railroads, and also to boards of health, who have any control over such matters.

Record of New Railroad Construction.

This number of the *Railroad Gazette* has information of the laying of track on new railroads as follows:

Chicago, Rock Island & Pacific.—The *Sigourney Branch Extension* has been completed to Oskaloosa, Ia., 9 miles west of the point reached at the end of 1875.

Kansas City, Burlington & Santa Fe.—Completed from Leavenworth, Lawrence & Galveston, near Ottawa, Kan., southwest to Williamsburg, 13 miles.

Scioto Valley.—The length of this road as completed from Columbus, O.; south to Ashville is 21 miles, of which 14 miles was laid in 1875. Twelve miles was noted.

This is a total of 29 miles of new railroad, making 99 miles completed in the United States in 1876. The 14 miles of the Scioto Valley brings up the total completed in 1875 to 1,593 miles.

THE NORTHERN PACIFIC RAILROAD has been voted a subsidy of $3,500,000 by both houses of the Montana Territorial Legislature. There is hardly an imaginable case in which a subsidy is more justifiable. Montana has no railroad, and for the most part no outlet to the rest of the world except by coaches over execrable roads for long distances. Whether it would be better to seek an outlet by the extension of the Northern Pacific or by a line to connect with the Union and Central Pacific in Utah may be questionable; but, certainly, the inhabited part of the Territory will profit greatly by a railroad, and is, therefore, the proper party to pay for one. Still there are considerable difficulties involved, and, doubtless, some injustice will be done by assessing the cost of the road, or the aid to the road, equally on all the taxable property of the Territory. Fort Benton, for instance, away to the north of the chief towns and mines of the Territory, at the head of high-water navigation on the Missouri, and owing its prosperity almost wholly to the traffic from the vessels to the districts southward, would probably have its business ruined by the construction of the railroad for which it would pay as much in proportion as the towns on the line of the road, which would be immensely benefited by it. This is a fundamental difficulty in railroad subsidies. The benefits, perhaps immense as a whole, are very unequally distributed, while the taxes are not; one man may pay more for what ruins the value of his property than another for what creates value for his. Justice would require that assessments for subsidies should be in proportion to the benefits received; but in the case of railroads no one seems to have discovered a practical method of doing this.

THE LAW PROHIBITING TERRITORIAL SUBSIDIES, introduced into the lower house of Congress recently, would have prevented the act of the Montana Legislature giving three millions and a half to the Northern Pacific Railroad. Probably there is no place where subsidies can be more justly given than in a territory where most of the land has little or no value and will have a value created by the construction of a railroad, while the railroad, usually, cannot for a long time expect to earn interest on its cost from the profits on the trifling amount of traffic existing. Yet there are decided objections to giving Territorial municipalities free swing in voting subsidies. Such subsidies are for the most part (and properly, too,) paid by the land. Now in territories usually all but an insignificant fraction of the land is owned by the United States Government, which is neither a voter nor a taxpayer. If I, sole inhabitant of Sitting Bull County, Dakota, owning there 160 acres of land, vote unanimously in favor of granting $100,000 of my county's bonds to the East & West Railroad, by that act I substantially mortgage in advance perhaps as much as 600,000 other acres, now owned by the general government, as soon as they shall have been purchased by individuals. Apparently, the chief owner of the land should have something to say as to the incurring of such a debt. Moreover, as in the case of the Northern Pacific in Montana, the population of an enormous territory may be concentrated in a mere corner—not a hundredth part of its area perhaps—and yet it might impose taxes on the future inhabitants of the unoccupied parts for the sole benefit of their little section.

THE WISCONSIN POTTER LAW is at last repealed. What is known as the "Vance bill," a substitute for it, and destitute of those provisions which have made the Potter law one of the most striking examples of ignorance and recklessness in legislation, passed the lower house of the Wisconsin Legislature last Monday by the decisive vote of 56 to 20. It had previously

passed the Senate, and the new Governor in his message recommended the repeal of the Potter law, so there is probably no doubt that he will approve the new bill. There have been probably exaggerated estimates of the actual effect of the Potter law in preventing railroad extension in Wisconsin, though it would not be easy to estimate its potential effect, if we may use the expression. We do not believe that much if any more railroad would have been constructed in Wisconsin, under the actual circumstances, had no Potter law ever been mentioned, simply because there were at the time other sufficient obstacles; but if these other obstacles had not existed, the Potter law would have been sufficient to prevent any investments in new railroad property in Wisconsin unless they had been necessary to preserve the value of old ones. Indeed, we have been informed that large investments in other enterprises have been prevented by the law; and there can be no doubt that the credit of the State has suffered terribly by the passage and enforcement of the act, and that, in spite of the repeal, it will not soon recover. To any one who sees the foreign financial papers this is only too evident. Investors were absolutely horrified by the act and by the disposition in the community which permitted its passage. Hence, the Potter law, strange as it may seem, will probably prevent railroad construction hereafter, when it is repealed, more than it did while it was actually in force; because the time is approaching when under ordinary circumstances there might be a considerable revival of railroad construction in Wisconsin, which the memory of the Potter law and the distrust of a community that was ever capable of such a measure will tend to delay.

LIVE STOCK TRANSPORTATION is the subject of a bill passed by the United States Senate last Monday, which restricts to 24 hours the time that cattle may be kept in cars, establishes a penalty for violating the act, and gives certain rights to societies for preventing cruelty to animals to assist in enforcing the act. The provisions as to limit of time are the same as made by the present law, we believe, and the aim of the new bill is, we suppose, to secure the better enforcement of these provisions. Now, they are commonly violated, and carriers and stockmen frequently and perhaps generally justify the violation, saying that the stock suffers less by the great fatigue of a long journey than by an additional loading and unloading; that most cattle after a day's ride are frightened and refuse to eat enough to keep up their flesh, and that on the whole the cattle reach market in better order after two or three very long journeys than after four or five shorter ones. As the stock-owners are most affected by anything that injures the market value of their animals, their opinion ought to have most weight in this particular; but doubtless they do not much regard any suffering of the cattle which does not reduce their value. Whether the injury to weight and quality of meat is just in proportion to the suffering from long journeys, is a problem of which we have seen no solution. If it is, the regulation of the transportation can be left to the owners of the cattle. There is no doubt, however, that by existing methods there is a great deal of suffering, and that more attention should be given to means of reducing it. Any regulation, be it an improvement or otherwise, which adds to the cost of transportation, will practically reduce the market value of cattle in districts far from market, and will reduce it most in the most distant districts.

THE VANCE BILL just passed by the Wisconsin Legislature as a substitute for the Potter law provides for one Railroad Commissioner instead of the present board of three, gives him a general supervision of the condition and management of the railroads of the State, and requires of each railroad an annual report to the Commissioner, who moreover is to inquire into complaints of violation of the law. The railroads are required to treat all shippers alike, under similar circumstances, are forbidden to charge unreasonable rates, and required to supply facilities for shipping freight upon reasonable notice. The penalty for a violation of the act is three times the actual damage sustained, together with the costs of the suit necessay to collect it. The consolidation of competing lines is forbidden. No person connected with a railroad may be permitted to sell it supplies or engage as a common carrier on that road. With regard to rates, those in force on the Milwaukee & St. Paul Railway, June 15, 1872 (before the passage of the Potter law), may not be exceeded on that road nor on the lines of the Chicago & Northwestern; and these companies must sell at all their stations 500-mile tickets and round-trip tickets to all stations in the State at a uniform rate of 3 cents per mile. The bill is to take effect April 1 next.

THE ERIE PROPRIETORS' COMMITTEE arrived in New York last week and has begun its work. The members announce their purpose to carry out the plan approved at the London meeting if the owners of the stock and the lower classes of bonds assent to it; but they further make the very important statement that if these parties do not assent they will proceed to foreclose the first consolidated mortgage. Thus the Committee seems to represent generally the proprietors of all classes, but also to be special agents of the holders of the first consolidated bonds. Probably just now their chief attention is directed to propositions for the modification of the plan presented at the London meeting, which was left open to such changes as the Watkin committee should consider advisable after consultation with stock and bondholders of different classes in Europe and America. Perhaps the most notable thing in connection with the negotiation is the very slight interest in it manifested by American proprietors. One might think that there were no longer stockholders here, or that they have finally determined to abandon their interest as hopeless. The important thing to know now is how much time the first consolidated bondholders will grant to the lower bondholders and stockholders to accept the scheme of reorganization.

JANUARY EARNINGS have been reported so far for fifteen railroads, eleven of which show an increase, amounting in all to $458,000, while the other four show an aggregate decrease of $31,000. Some of the increases are very large—six more than 25 per cent., and nine more than 10 per cent. The comparisons are with a very unfavorable year, however, January earnings last year having been worse even than in 1874.

NEW PUBLICATIONS.

Bridge and Tunnel Centers. By John B. McMaster, C. E. (New York: D. Van Nostrand. 1875.)

This work, we believe, originally appeared as a series of articles in *Van Nostrand's Magazine*. In its present form, according to the preface, it professes "*To present in as brief a manner as the nature of the subject will allow, the rules and principles, the application and observance of which* is *(sic) of really vital importance in the planning and construction of bridge and tunnel centering.*"

As a handbook this little treatise is to be recommended, though we are by no means ready to affirm that Mr. McMaster has either exactly filled the existing want of a summary on the subject, or that his little book does not need some careful revising. Still, the profession is indebted to him, if for nothing else, for contributing to engineering literature a book which, if it is a somewhat hasty and crude production, yet is one that will cause every engineer who reads it, if he happens at the time to be putting up a bridge or arching a tunnel, to look a little more carefully at his centers, and if he is not practically at work, we will wager he will begin to consider, first, whether his centers in the past have generally fulfilled Mr. McMaster's conditions; and if not, whether the designs he used weren't good enough, and if they were, whether he couldn't write a set of demonstrations proving that his rule of thumb was quite as reliable as Mr. McMaster's deductions, etc., etc. In fact, one of the great, what we might term subjective, advantages of these contributions to technical literature is found in the fact, providing they are reasonably accurate and reliable, that even if they do contain mistakes, and do not always meet the situation, still they make men think, and think often on matters they had hitherto considered as quite settled in their minds.

As to Mr. McMaster's general treatment of the subject, we think the limited space he has given to the discussion of the strictly mathematical points involved to be quite sufficient. He has very evidently borne in mind that a hand-book is not a mathematical treatise, and such formulæ as are given are either very concisely discussed, or introduced as accepted principles. His observations (p. 70) on striking centers, always a delicate matter in heavy work, are well considered and to the point, and we agree with him in advocating the *easing* not *striking*, of course, of centers as soon as the arch is keyed in, in preference to the plan advocated by some, of never moving centers until the mortar has hardened.

The labored description (pp. 71 and 72) of what are, and how to use, ordinary slack blocks, would be more in place in an apprentice's primer than in a hand-book for engineers. Not so the space devoted (p. 76), to the plan of striking centers, by resting the bearings of the ribs when first set upon cylinders filled with sand, from which the sand is allowed slowly to escape when the time comes for easing them. Mr. McMaster would have done well, however, to have accredited the system to its inventor, M. Beau de Moulin, of the Corps des Ponts et Chaussées.

A full description of a very successful application of this system will be found in *The Builder*, vol. 28, p. 878 (Nov. 5, 1870).

There is what we should feel inclined to call a very careless error (p. 77) in the discussion of the distances apart centers should be placed, and the same error is carried through the subsequent table, (p. 78). Where, may we be allowed to ask, has Mr. McMaster found stone, suitable for arching, "*weighing 150 lbs. per cubic yard;*" unless, indeed, he has been accustomed to the use of tufa or pumice-stone as a building material? We suppose, of course, he means *per cubic foot*, but why doesn't he say so, then?

We emphatically second Mr. McMaster in his very sensible comments (p. 94) on the penny-wise and pound-foolish plan of having an insufficient number of centers on hand in tunnel work. Undoubtedly, as we before said, centers should be *eased* shortly after the keying of the arch, but never *struck* until the mortar or cement has had time to set and harden, especially in tunnel-work where there may be a heavy and unequal pressure to be at once sustained.

Mr. McMaster is entirely too fond of borrowing without thanks, or even acknowledgment. He tells us (p. 83) that "*Figs. 5 and 6* (which, by the way, should be 6 and 7) *afford an illustration of two center ribs arranged to meet these requirements*," etc., etc. As these two designs for center ribs are taken *in toto* from designs given in Simms' Tunnelling (London, 1844), and are, in fact, copies, and poor ones at that, of Figs. 3 and 4, Plate 9, of that rather fossilized work, it would at least have been graceful to have acknowledged the fact, and allowed the interested reader an opportunity of admiring the evident cautious conservatism (?) that prompted their selection.

As to the unfortunate misprints running throughout the work, we should advise Mr. McMaster, if his book reaches a second edition (which we sincerely think it deserves, for there is much good in it), to read his own proofs and correct the following errata, in illustrations and type:

P. 38. We cannot find in Fig. 2 the "iron bands" referred to, as uniting the struts with the tie beam and back pieces.

P. 54. "*In computing the strains on the braces a, a.*" We fear we should need a pair of "Sam's" "double-million gas microscopes" to find any "*a, a*" in Fig. 3.

P. 59. "*Here the C F, H F and D d.*" *H F* is right, but Fig. 5 shows *H H* where *H* should be.

P. 61. "*E h is drawn parallel to E F.*" Here *E h* should read *e h*.

P. 68. "*So as to draw the tenon sight into the mortise, and so cause the Thoulder to butt very snugley.*" Very snugley, we don't doubt, but it's an involved way of putting it.

P. 74. In speaking of the striking of cocket centers, reference is made to "Fig. 4" instead of "Fig. 5," which makes the description utterly unintelligible.

P. 83. "Figs. 5 and 6 afford an illustration," etc., should read "Figs. 6 and 7." The same error occurs where these figures are subsequently referred to on pages 85 and 88.

P. 95. The reference to "Fig. 7" should read "Fig. 8," and in said "Fig. 8" one of the "C's" should be marked "C'," according to the reference on page 95.

Valuation and Purchase of Railroads. (Werth und Kauf der Eisenbahnen): by Baron Von Weber. Vienna, A. Hartleben.

This is the second of a series of pamphlets which the eminent author is issuing under the title of "Popular Discussions of Current Railroad Questions." He takes up the subjects of value and purchase because in Europe, and especially in Austria, as well as in this country, the financial disasters of the past three years have left a great number of bankrupt railroad companies, whose property, in one way or another, must be transferred into stronger hands before it can be completed and fully utilized. Thus there are frequent occasions for ascertaining the value and devising the methods of purchase of railroad property. As Baron von Weber shows, this is no simple matter. Railroads are not commodities like wagons and houses, which are being interchanged constantly, and have a market value fixed by the supply and demand. Each railroad is a unique property; there is but one like it to be sold, and (which makes the establishment of a selling price especially difficult) there are usually but two or three possible purchasers. Baron von Weber in this pamphlet seeks to establish the following statements: Railroads in countries which exercise a regulating power over them are not simply money-making institutions; in such countries they have no commercial but only a national economical value, and may not be estimated by their material value, when they fail to earn an income on the capital invested, as this would be a denial of the previous proceedings of the Government in authorizing and chartering the road as tending to the general welfare, and would damage the entire railroad credit of the country. He then sets forth the method of fixing the price of a railroad which is to be purchased by the State (as many bankrupt roads are bought in Germany and Austria); and sets forth (as in previous works) what he believes to be the advantages of the State's owning and working some great systems of roads—a mixed system of State and private railroads—which he approves as far preferable to the monopoly of railroad transportation maintained in private corporations and minutely regulated by law, as in France, and as is now proposed for Austria in influential quarters.

The Polytechnic Review is the title of a new monthly scientific journal, published in Philadelphia by Drs. Wm. H. Wahl and Robert Grimshaw, who are also the editors. The prospectus announces that it will contain "original and selected articles descriptive of current progress in civil, mechanical, naval and sanitary engineering; gas and water supply and sewerage; chemical technology, with particular reference to mining, metallurgy and the manufacturing chemical industries; manufactures in general, and the mechanic arts." The editors and proprietors are men of scientific acquirements and reputation, Mr. Wahl having been at one time editor of the *Journal of the Franklin Institute*. The price of the periodical is three dollars a year. The first number issued this month has 12 pages like those of the *Railroad Gazette*, besides the cover, to which latter the advertisements are confined. The longer articles are on the improvement of the mouth of the Mississippi, with sections of the jetties; "the "Lowe Illuminating Gas Process," with a section of the gas works used; the "Metric System;" "Modern Fire Engines," with engravings; "Gas and Oil Engines;" "A Justifying Type-Setting Machine;" a selection from the new Pennsylvan a geological report on the production of the Pennsylvania oil wells; a department entitled "Progress in Science and the Arts" containing many short articles on technical matter, having as subdivisions "Engineering, Civil, Mechanical, etc.;" "Mining, Metallurgy, Mineralogy;" "Chemistry, Technology;" and "Miscellaneous." There are two columns of book notices. The paper is a handsome one, and the reputation and opportunities of its editors are such as to make it probable that it will be an unusually good one in some departments, especially in its record of technical progress, though it will need more space to do justice to the subject.

Nationalitaet und Eisenbahn-politik: Vienna.—A. Hartleben's Verlag.

Baron von Weber, for thirty years engaged in railroad affairs often in positions of the highest importance, has recently published a pamphlet entitled "Nationality and Railroad Policy," probably especially intended to affect the policy of Austria on railroad affairs, in which he condemns the following of the policy of any given country simply because it has proved successful in that country. He asserts that each country must develop its own policy, suited to its special circumstances, and can imitate another only when it is the policy of a country in similar circumstances. This work is apparently intended in some degree to combat the approval of the French system expressed by the new minister, von Noerdling, who has translated with approval a part of a recent work by a French official, Franqueville, on the English policy as contrasted with the French. Franqueville assumed that the English amalgamations were quite similar steps in development to the establishment of the six great systems in France. Weber shows that there was a radical difference in the motives. "In England," says he, "it was the necessities of the great companies, in France, that of the small ones, which compelled the amalgamations." Especially Baron von Weber repels the uniformity in roads and methods of working them which the French system fosters, as utterly unsuited to a country like Austria (and like America, we may add) where the routes serve very varying needs. Each line needs to be developed to do its special work in the method best suited to that particular work. A perfect and costly heavy road will

the highest speed is a wasteful machine for carrying a traffic barely sufficient to employ one or two mixed trains daily. For the special circumstances of Austria he summarizes the principles of a suitable policy as follows:

1. The securing by the State of practical and effective influence on tariffs and on the construction and equipment and management of the roads of the entire Austrian railroad system by the acquisition of one railroad line in each principal current of traffic: the establishment of the mixed system of State and private railroads.

2. Removal of the financial weakness of many roads by:

a. Reduction of proportion of working expenses to receipts by changes in the method of operating according to the peculiarities of the line.

b. Abrogation of the rules and arrangements hindering this measure.

c. Transformation of main roads into secondary roads.

d. Reduction of the interest-bearing capital.

3. Temporary abandonment of the construction of roads or the main line system; completion of the system of connecting lines and extensions that are indispensable to the prosperity of Austria, but which corporations will not undertake, by the assistance of the State, or entirely through it.

4. Organization of the State's supervision of railroads on the basis of the mixed railroad system.

a. Transformation of the "General Inspection of Railroads" into a ministerial department.

b. Decentralization of the direct supervision and inspection into "local or provincial inspections."

c. Establishment of local directories for the management of the State railroad lines.

d. Recruiting of the inspection staff from the State roads; and its instruction on those roads.

5. Establishment of a railroad council for settlement of difficulties arising from the double position of the State management as owner of railroads and official inspector, and for the moral support of the government in the decision of questions of railroad policy.

OLD AND NEW ROADS.

Continued from Page 79.

Utah Northern.

The Legislature of Montana has passed a bill submitting to the vote of the people of the Territory, at a special election to be held April 3, the question of granting a subsidy of $1,150,000 in aid of the extension of this road into the Territory.

Poughkeepsie & Eastern.

Mr. Charles Wheaton, trustee, gives notice that he will distribute among the first-mortgage bondholders the fund in his hands arising from the foreclosure and sale of the road, upon presentation of the bonds at his office, No. 24 Market street, Pooghkeepsie, N. Y.

Mobile & Ohio.

In response to an inquiry as to whether a plan for the reorganization of the company was to be submitted soon, William Butler Duncan, trustee and receiver, says: "The past eight months of our management as trustees and receivers have developed many and various defects and considerations which require delicate and timely adjustments; serious troubles would arise on all sides, should any degree of rough haste be exercised. Time is required by the management to bring about the results now under process of solution, and our policy will be with the sole view to the improvement of the property and its business, that when a scheme of reorganization is finally adopted we may be enabled to turn them over to the reorganized company in good and serviceable condition.

"2. The company itself looking to its reorganization has already suggested to the court the necessity of their deciding at an early day upon the priorities and relative values of the several liens against the company—this will give the opportunity to any contesting parties to urge their claims, should they make any, in the most efficient and prompt manner, and it is hoped will avoid unnecessary questions being started by unscrupulous or designing parties.

"3. In the meantime a scheme of reorganization must be arrived at, based upon such safe and equitable grounds as will assure its prompt acceptance by all the interests involved—when it will become the duty and pleasure of the trustees and receivers to surrender to the resurrected corporation an improved property, capable of meeting faithfully all its future obligations."

Eastern.

The Investigating Committee appointed at the stockholders' meeting last week is composed of the following gentlemen: Seth J. Thomas, Geo. Ripley, Greeley S. Curtis, F. G. Monroe and W. A. Tower.

Dividends.

Dividends have been declared by the following companies:

Chicago & Alton, 4 per cent., semi-annual, payable March 1. Transfer books will be closed Feb. 16.

East Tennessee, Virginia & Georgia, 3 per cent., semi-annual, payable April 1.

Pennsylvania.

This company is now offering for sale, through bankers in England, $3,000,000 of its 6 per cent. consolidated mortgage bonds at 90. The bonds are stated to be part of an issue of $5,000,000, of which $2,000,000 have been placed in Philadelphia.

Meetings.

The following companies will hold their annual meetings at the times and places given:

Cleveland, Columbus, Cincinnati & Indianapolis, at the office in Cleveland, O., March 1. Transfer books are closed from Feb. 15.

Lehigh & Wilkesbarre Coal Co., at the office, No. 234 South Third street, Philadelphia, Feb. 24, at 1 p. m.

Burlington & Missouri River, in Burlington, Ia., Feb. 23, at 10 a. m.

Denver & Rio Grande.

Tracklaying on this road is making rapid progress, and the rails were expected to reach the Cucharas, nearly 60 miles south of Pueblo, next month.

Scioto Valley.

Mr. J. B. Peters, Superintendent of the road, writes us as follows: "We completed 14 miles of track, Columbus to Lockbourne, during the year 1875, and since that time have completed seven miles more, taking us to Ashville. We are graded and bridged to Chillicothe (with the exception of probably 10 days' work), and all the material on hand to complete track. We have been very much delayed by the extremely wet and open winter. We hope to reach Chillicothe not later than the 1st of May.

"We hope to reach Circleville early in March, and as soon as the road is finished to Circleville we will put on regular trains between Columbus and Circleville."

Pekin & Mississippi.

A meeting was held in Canton, Ill., Feb. 9, for the purpose of making arrangements to build this projected road as a narrow-gauge line. It was stated that the old company owned some 20 miles of graded road-bed and $130,000 in subscriptions still available. After some discussion as to the route committees were appointed to canvass for subscriptions and report to an adjourned meeting.

Boston & Providence.

The reduction of 10 per cent. in the wages of employes which was urged last fall and prevented by the decided opposition of President Clifford has now been made, to take effect March 1.

Louisville, New Albany & Chicago.

There is talk of building a branch from Bainbridge, Ind., southwest to Brazil in Clay County, about 25 miles.

Portland & Ogdensburg.

This company has notified the city of Portland, Me., that it will be unable to meet the March coupons on the $1,350,000 city bonds issued in aid of the road. The reason given is that the large amount required to complete the connection with the Vermont Division has absorbed all the available earnings of the road. The coupons on the bonds issued by the company will be paid.

A meeting of the stockholders was held in Portland, Feb. 14, but adjourned to Feb. 26 without taking any action.

The town of Lunenburg, Vt., has voted not to issue the $50,000 of town bonds heretofore granted to the road.

Maryland General Railroad Law.

A law to take the place of the law of 1870 is now pending in the Maryland Legislature. It provides that any number of persons not less than five, three of whom must be citizens of Maryland, may form a company and shall file with the Secretary of State a certificate showing the termini and route of the proposed road and the amount of capital stock, which must be divided into shares of $50 each. The following sections provide the manner of organizing the company, confer the usual powers and prescribe rules for condemning land, bridging streams, changing location when necessary, and protecting road crossings. No company shall be allowed to build a railroad in or through the city of Baltimore without consent of the municipal authorities. Companies organized under the law may borrow money and issue bonds to an amount not exceeding the capital stock. No company will be allowed to consolidate with any other, to buy the stock of any other, or to lease or sell its road without authority from the Legislature. The maximum rates to be charged by any company organized under the law are fixed at 3 cents per passenger per mile, 1½ cents per ton per mile on ores, coal or other minerals and 5 cents per ton per mile on all other freight.

Philadelphia, Wilmington & Baltimore.

This company is building a new freight depot 100 by 400 feet at Broad and Carpenter streets in Philadelphia. Considerable additions and improvements are also being made in the passenger depot on Broad street.

San Diego & Southern Utah.

A company is to be organized to build a railroad from San Diego, Cal., northeast to a connection with the Utah Southern. It is proposed to build from San Diego northward to a connection with the Los Angeles & Independence, to follow the line of that projected road, and then run across Southern Nevada into Utah by a line said to be feasible.

Syracuse & Southwestern.

The organization of this company has been completed. It is formed in the interest of the Utica, Ithaca & Elmira, and for the purpose of constructing the Syracuse connection of that road.

New Orleans Pacific

The Louisiana Legislature has passed resolutions indicating this company's road as the proper line to receive a subsidy as the New Orleans Branch of the Texas & Pacific. The resolutions also provide for the forfeiture of the charter granted the New Orleans, Baton Rouge & Vicksburg Company for a line from New Orleans to Shreveport.

Dallas & Wichita.

The dissensions which caused the stopping of work on this road have been settled by a compromise, the city of Dallas agreeing to buy the interest of Dr. J. W. Calder for $30,000. Work will be resumed at once, and the company hopes to have the road, 15 miles of which are graded and bridged, completed to Denton, 35 miles northwest of Dallas next season.

Marietta & North Georgia.

A preliminary survey has been begun and as soon as the necessary lines can be run the final location will be made. The company is trying to secure aid from the State of Georgia.

Texas & Pacific.

The Tarrant County Construction Company has completed about two-thirds of the grading between Fort Worth, Tex., and Eagle Ford. It is said that Vice-President Bond has made arrangements for the iron and also for the rails for the unfinished section of the Transcontinental Division, from Brookston to Texarkana.

Lafayette, Muncie & Bloomington.

It is reported that the difficulties between this company and the Indianapolis, Cincinnati & Lafayette with respect to the entrance into Lafayette, Ind., are to be adjusted by a compromise.

St. Louis, Keokuk & Northwestern.

Iron for the extension from Hannibal, Mo., to Louisiana is now being received from the Kansas City Rolling Mill. Tracklaying is to be pushed as fast as possible. When the extension is completed trains will be run between Keokuk and St. Louis, using the Chicago & Alton track from Louisiana for a time. It is intended, however, to build from Louisiana through Clarksville to the St. Louis, Kansas City & Northern at Dardennes, a distance of about 50 miles, a considerable part of which was graded three years ago.

Connecticut Central.

The company is offering an issue of $400,000 first-mortgage 7 per cent. bonds due 1895, with interest payable April and October in New York, at 90 and interest. This issue is at the rate of less than $20,000 per mile, and the rental which the Connecticut Valley Company has agreed to pay more than covers the interest. The strength of the bonds depends chiefly on the strength of the lessee corporation.

Toledo, Wabash & Western.

Argument in the foreclosure suit under the consolidated mortgage in Indiana is to be heard in the Circuit Court at Logansport, Feb. 23.

The stockholders' committee has made an appeal to the holders of prior mortgage bonds to join them in resisting the foreclosure. They argue that by foreclosure and reorganization the company would lose the protection of its special charters and become subject to the general laws of the States through which it passes. This, they say, would seriously impair the value of the property and the security of the prior liens. They also charge that a very small consideration in money was received for the gold bonds issued, most of them having been hypothecated, while those sold brought a very low price.

Macon & Brunswick.

A bill is pending in the Georgia Legislature for funding the bonds issued by this company and indorsed by the State, which provides for the issue of new State bonds to be exchanged for the indorsed bonds. It meets with strong opposition, and its passage is doubtful.

Missouri, Kansas & Texas.

A conference was recently held in Sedalia, Mo., between officers of this road and the assessors of the counties in Missouri through which the road runs. Railroad Commissioners Marmaduke and Walker were present. The officers proposed that the property be assessed at a uniform rate of $7,500 per mile for the road-bed, $5,000 for each engine, $2,500 for each passenger car, and so on, the equipment to be distributed *pro rata* to each county according to the miles of road within its limits. No final conclusion was reached, but the proposal was generally approved and will be presented to the various county courts for their action.

Minneapolis & St. Louis.

There is some talk of the extension of this road from its present terminus at the St. Paul & Sioux City Crossing southward, according to the original charter. The company has asked the Minnesota Legislature to amend that charter by allowing it to make the southern terminus at Albert Lea instead of the Iowa line. The request is reasonable, as connections can be made at Albert Lea which will obviate the necessity of building any more road. On the other hand, the City of Minneapolis has asked to be relieved from the obligation to issue an additional $125,000 of bonds to the company in the event of the completion of its road.

Keokuk, Galesburg & Chicago.

A company by this name has filed articles of incorporation in Illinois and purposes building a narrow-gauge road on the line indicated by its name. The capital stock is fixed at $1,000,000. A new feature proposed is that the company issue certificates of transportation in exchange for money subscribed to the road. The certificates will, when the road is built, be receivable for 50 per cent. of transportation charges on freight or passengers, the amount of such charge to be endorsed on the certificate until it is finally liquidated. Most of the incorporators are Galesburg men.

Northern Pacific.

The Montana Legislature has passed the bill providing for a subsidy of $3,500,000 in Territorial bonds for the extension of this road into the Territory. The question is to be submitted to the people at a special election to be held April 3. The subsidy is conditional on the company's raising money otherwise to extend its line from Bismarck west 500 miles to Bozeman, which is within 120 miles of Helena, Montana.

Union Pacific.

The following statement of earnings and expenses for the year ending Dec. 31 is published:

	1875.	1874.	Inc. or Dec.	P. c.
Passengers	$4,346,014 34	$3,952,758 55	Inc.. $393,185 79	9.9
Freight	6,641,512 27	5,664,731 33	Inc.. 976,780 94	17.2
Mails and express	769,317 23	727,061 77	Inc.. 42,255 46	5.8
Miscellaneous	236,988 25	215,228 47	Inc.. 21,759 78	10.1
Total earnings	$11,993,832 09	$10,559,880 12	Inc. $1,433,951 97	13.6
Operating expenses	4,982,047 95	4,652,314 95	Inc.. 329,733 00	7.1
Net earnings	$7,011,784 14	$5,907,565 17	Inc. $1,104,218 97	18.7
Gross earnings per mile	$11,622	$10,232	Inc.. $1,390	13.6
Net earnings per mile	6,794	5,724	Inc.. 1,070	18.7
Per cent. of expenses	41.54	44.05	Dec.. 2.51	5.7

Erie Southern.

The $5,000 per mile necessary to permit the complete organization of this company under the general law has been all subscribed, and new subscriptions continue to come in. Two lines have been surveyed from Erie, Pa., to Cambridge, and another will probably be run. The final location will depend much upon the amount which can be raised upon the line.

San Luis Obispo & Santa Maria Valley.

Chief Engineer L. H. Shortt writes under date of Jan. 30: "The first section of the First Division of the San Luis Obispo & Santa Maria Valley Railroad (narrow gauge) was opened for traffic Jan. 29. The road, notwithstanding the exceptionally wet season we have just passed through, worked well.

"As soon as the ground will allow of it work will be resumed and the road opened to the town of San Luis Obispo about the middle of May.

"Great improvements in the shipping facilities at Avila are contemplated."

New Brunswick.

Efforts are being made to secure a subsidy of $5,000 per mile for a branch line to leave this road on the east side of the St. John River and run eastward to the head of Grand Lake, and thence southeast to the Intercolonial at Sussex or Apohaqui. It would be some 75 miles long.

Surry.

This company proposes building a light railroad from Low Point on Chipoax Creek, in Surry County, Va., to the Blackwater River and the Atlantic, Mississippi & Ohio, at some point between Wakefield and Disputanta. The road would be about 15 miles long.

Sutherlin & Milton.

This company wants to build a narrow-gauge road some five miles long from Sutherlin, Va., on the Richmond & Danville road, southward to Milton, N. C.

Brunswick & Albany.

This company is petitioning to be relieved from the taxes due the State of Georgia for 1874, 1875 and 1876, amounting to $11,550 in all. The grounds on which this relief is asked are that in the two years which the present owners have held the road it has not earned its working expenses, but has run behind over $40,000. If, in addition to this loss they are obliged to raise the money for the taxes, they will be forced to abandon the road and cease to operate it. They claim that the road, while it has been a dead loss to its builders and owners, has largely increased the value of the taxable property along the line, and claim that some consideration is due them from the State.

Galveston, Harrisburg & San Antonio.

The city of San Antonio has voted the new subsidy asked for by the construction company organized to complete this road. Work will now be pushed on the road.

East Tennessee, Virginia & Georgia.

At a meeting of the directors held in Knoxville, Tenn., last week, resolutions were passed directing and authorizing the officers to have a survey made at once for the four miles of

road necessary to complete the Cincinnati, Cumberland Gap & Charleston road from the present terminus at Wolf Creek, Tenn., to the North Carolina line, and to let the necessary contracts as soon as they were assured of the early completion of the Western North Carolina road.

A committee was appointed to examine into the business transacted at the various stations on the road, with a view of discontinuing those which are unnecessary or unprofitable.

The board resolved to declare the usual semi-annual dividend of 3 per cent.

The Western North Carolina people promise, if the connection to the State line is completed, to begin work on that end of their road as well as on the eastern end of the unfinished portion.

Knoxville & Ohio.

The merchants of Knoxville, Tenn., are urging the importance and necessity of extending this road, which now runs from Knoxville northward to Careyville, about 30 miles, some 28 miles further to a connection with the Cincinnati Southern. It is urged that this will not only make a good line from Cincinnati to Knoxville and Dalton, but that it will furnish a desirable outlet for the Blue Ridge road in the event of its completion to Knoxville.

Chicago, Rock Island & Pacific.

The extension of the Sigourney Branch westward is now completed to Oskaloosa, 25 miles west of Sigourney and 53 miles from the junction with the Southwestern Division at Washington. Trains were to run to Oskaloosa this week. Work on the grading between Oskaloosa and Knoxville has been begun.

Kansas City, Burlington & Santa Fe.

This road is now completed from the junction with the Leavenworth, Lawrence & Galveston, three miles south of Ottawa, Kan., southwest 13 miles to Williamsburg. It was to be formally opened for traffic Feb. 14. The new line opens up a large deposit of coal of a superior quality, and is expected to have a considerable traffic from that source. Surveys have been made for an extension of 27 miles further to Burlington on the Neosho River.

Montpelier & Wells River.

Concerning the recent decision of the Court in this case the St. Albans *Messenger* says: "It is hard telling which party triumphed in the Wells River railroad suit. Sortwell certainly got the road into a receivership and thus beat the Brock-Vermont Central party, but the receivers may beat him on the execution. Bingham is a well known Central man, and if it don't turn out that Jo Hatch has some time or other seen Thompson, then things are different from what they used to be. But then, of course, the court intended to appoint fair men, for these are all 'honorable men.'"

West Jersey.

At the annual meeting in Camden last week, the report showed a slight increase in gross and a large one in net earnings for last year. It was resolved to pass the usual semi-annual dividend and to use the money for the erection of the new depot at Cape May and for the purchase of new rails to be laid from the Cape to Millville.

Concord.

This company took formal possession of the leased Nashua, Acton & Boston road, Feb. 9, and will operate it hereafter in connection with its own road. The leased road extends from Nashua, N. H., southward to the Fitchburg Railroad at South Acton, Mass., and is 24 miles long.

Connecticut Central.

At the annual meeting in Broad Brook, Conn., Feb. 9, the following statement was presented:

Stock paid in, including 1,149 shares issued to contractors	$268,906 75
Rockville branch stock paid in	3,500 00
Funded debt	216,000 00
Floating debt	73,598 26
Total	$562,005 01
Construction	$516,557 00
Land damages	37,217 61
Sundries and taxes	4,301 70
	558,076 31
Balance	$3,928 70

Of which balance $3,000 has been spent on the Rockville Branch. The total cost of the road has thus been $26,575 per mile. There are about $12,500 uncollected subscriptions outstanding, most of which will be paid.

It was voted that the next meeting be held on the first Monday in November, and that that day shall hereafter be the appointed time for the annual meeting.

Cheraw & Chester.

The grading and trestle work are completed from Chester, S. C., eastward to the Catawba River, about 20 miles.

Peoria & Rock Island.

Receiver Hilliard's report for December is as follows:

Cash on hand Dec. 1	$11,763 46
Receipts from all sources	31,720 13
Total	$43,483 59
Disbursements	34,906 42
Balance on hand Jan. 1	$8,577 17

The disbursements exceeded the receipts by $3,186.29. During the month $1,159.43 was paid on right-of-way claims and $3,185 for a new locomotive.

San Francisco & North Pacific.

In answer to applications from the people along the line, this company has offered to extend its road from Cloverdale, Cal., northward to Ukiah, about 33 miles, if a subsidy of $5,000 per mile can be raised. Arrangements are accordingly being made to have a vote taken on the question of granting this subsidy in Mendocino County.

Wallkill Valley.

In the suit brought by the trustees to foreclose the first mortgage the New York Supreme Court has appointed James A. Jones Receiver. The road has been in the hands of the second-mortgage bondholders, who bought it last year under foreclosure of their mortgage.

Rutland.

It is reported that the directors of this company and those of the Central Vermont have agreed upon a compromise on the points at issue between the companies. The Rutland is to receive the back rent due by the Central Vermont, about $250,000, and the present lease will be modified so that the earnings of the Rutland, the Vermont Central and the Vermont & Canada will be pooled, each company to receive a fixed per centage of the earnings. The agreement, it is said, will be submitted to meetings of the stockholders of both companies to be held Feb. 25.

Greenville & Columbia.

In the suit brought to compel H. H. Kimpton to surrender $62,500 bonds of this company, the United States Circuit Court has decided that the mutual releases signed by Kimpton and President Magrath were good and binding, and that the surrender of the bonds could not be compelled. The bonds were a part of those divided among the stockholders of the Continental Telegraph Company, and all the rest have been restored. Mr. Kimpton was formerly financial agent of the Greenville & Columbia and when the control of that company passed to the South Carolina Company, he settled his affairs with President Magrath and mutual releases were given, which the court now holds to include the bond transaction with the Continental Telegraph Company. Notice has been given of an appeal to the Supreme Court.

Mackinaw & Marquette.

A new company has been organized in Lansing, Mich., to build this road, and has submitted a proposition to the Board of Control of State lands. The company agrees to have 50 miles done by Aug. 1. Capt. E. L. Craw is at the head and there are some Chicago parties interested.

Louisville, Cincinnati & Lexington.

The Auditor, Mr. Wm. Mahl, furnishes the following statement for the year ending Dec. 31:

	1875.	1874.	1873.
Gross earnings	$1,133,951 97	$1,121,298 03	$1,106,171 45
Operating expenses, ordinary	716,322 32	851,244 48	892,236 62
Net earnings	$417,629 65	$270,053 55	$213,934 83
Cost of ties and rails put in track	104,272 37	49,145 73	42,439 91
Net transportation earnings	$313,357 28	$220,907 82	$171,494 92
Per cent. of ordinary expenses	63.17	79.85	80.66
Per cent. of ties and rail renewal	9.20	4.38	3.84
Per cent. of total expenses	72.37	80.23	84.50

The gross earnings for 1875 showed an increase of $12,653.94, or 1.1 per cent., over 1874, and of $27,780.52, or 2.5 per cent., over 1873. The net earnings showed an increase of $92,449.46, or 41.9 per cent., over 1874, and of $141,862.36, or 82.7 per cent., over 1873, in spite of the large increase in renewals. The amounts of $26,903.26, paid for injuries to persons in 1874, and $9,967 for the same account in 1873 are not included in the above.

The December statement is as follows:

Passengers		$38,174 16
Freight		53,470 17
Miscellaneous		7,263 25
Total earnings		$98,907 58
Ordinary expenses	$60,048 53	
Renewals of ties and rails	5,265 75	
		65,314 33
Net earnings		$33,593 25
Rentals and guarantees	$2,489 31	
State tax	1,451 19	
		3,940 50
Balance		$29,652 75

Which is added to the amount subject to orders of the Court.

Harrisburg & Conewago.

A company by this name has been organized to build a railroad about 15 miles long from the Harrisburg & Potomac near Harbolt's Mill, in Cumberland County, Pa., south by east to Emig's Mills, in York County, and thence to East Berlin in Adams County. At the latter place connection will be made with the proposed Berlin Branch.

Detroit & Milwaukee.

Herapath's Journal, of Jan. 29, says:

"Messrs. J. F. Joy, Z. Chandler and C. H. Buhl offer to reorganize this company, giving the holders of the first and second bonds and coupon bonds two-thirds of their amount in a new first charge set of bonds bearing 6 per cent. currency, or 6 per cent. interest in gold, interest commencing to run one year from the time of sale of the line; there is also to be created a million of dollars of the same first charge bonds to bear 7 per cent. interest, the proceeds being used to put the road in condition. The Great Western of Canada Board recommend the proposals for acceptance. They seem to us fair, and as much as the bondholders can expect."

Pennsylvania Line.

A company by this name has been organized to build a railroad from Cumberland, Md., to Ellerslie in Allegheny County. The capital stock is to be $350,000, and the corporators are M. A. Healy, Denis Sheridan, Ferdinand Williams, F. K. Laing, Jr., George G. McKay, John F. Zacharias and John F. Buckholtz.

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North Pennsylvania.

This company owns a line from Philadelphia northward to Bethlehem, 55.6 miles; the Doylestown Branch, 10.3 miles; Shimerville Branch, 1.8 miles, making 67.7 miles. It works under lease the Northeast Pennsylvania road, 9.8 miles, and the Stony Creek road, from Lansdale to Norristown, 10.3 miles, whose earnings are reported separately. Since the close of the year it has completed the Delaware River Branch, 20¼ miles, which is to be part of the new line to New York from Philadelphia.

The credit side of the capital account was as follows at the close of the fiscal year, Oct. 31, 1875:

Capital stock ($45,013 per mile)	$3,078,150 00
Bonds ($66,049 per mile)	5,825,500 00
Dividend scrip	156,727 50
Ground rents and mortgages	414,743 22
Unpaid accounts and coupons	253,964 11
Profit and loss balance	367,152 41
Total ($124,665 per mile)	$10,996,237 24

The company holds $151,150.50 securities of other corporations, and has advanced $36,028.58 to the Northeast Pennsylvania and $78,751.83 to the Stony Creek Company.

The earnings of the road for the year were as follows:

	1874-75.	1873-74.	Inc. or Dec.	P. c.
Freight and coal	$908,406 35	$890,499 61	Inc. $17,906 74	2.0
Passengers	484,392 90	505,916 89	Dec. 21,523 99	4.2
Mails	6,195 00	6,195 00		
Miscellaneous	18,740 36	21,851 68	Dec. 3,111 32	14.2
Total earnings	$1,417,734 61	$1,421,463 18	Dec. $6,728 57	0.5
Maintenance of way	200,624 10	161,663 29	Inc. 38,960 81	24.1
Motive power	281,674 85	357,706 72	Inc. 26,863 90	7.5
Maintenance of cars	102,895 77			
Conducting transportation	286,821 35	279,154 57	Inc. 7,666 78	2.7
General expenses	33,526 20	31,201 05	Inc. 2,325 15	7.5
Taxes, State and other	45,641 58	38,790 87	Inc. 6,850 71	17.7
Total expenses	$951,183 85	$868,516 50	Inc. $82,607 35	9.5
Net earnings	$466,550 76	$555,946 68	Dec. $89,395 92	16.1
Gross earnings per mile	$20,941	$21,041	Dec. $100	0.5
Net earnings per mile	6,891	8,212	Inc. 1,321	16.1
Per cent. of expenses	67.09	60.97	Inc. 6.12	10.0

The earnings of the two leased lines were as follows:

	1874-75.	1873-4.	Increase.	P. c.
Northeast Pennsylvania	$24,645 00	$18,149 62	$6,495 38	35.9
Stony Creek	18,642 22	16,632 33	2,009 89	12.1
Total	$43,287 22	$34,781 95	$8,505 27	24.4

The Northeast Pennsylvania earnings were $2,515, and the Stony Creek, $1,810 per mile.

The total number of passengers carried on the main line and Doylestown Branch was 1,067,494, an increase of 14,635, or 1.4 per cent., over the preceding year.

The income account was as follows:

Net earnings	$466,550 76
Interest on bonds, ground rents, etc., less interest received	306,023 75
Surplus for the year	$160,527 01

Two dividends, each of 3 per cent., were declared from the year's business, one paid Aug. 2, 1875, the other Feb. 1, 1876.

Since the close of the year the Delaware River Branch, from Jenkintown to the Delaware near Yardleyville, 20.5 miles, has been completed. The work was done under the direction of Mr. Francis H. Sayler, Engineer in charge, McGrann & Fitzpatrick being contractors for the grading and J. H. Cofrode & Co. for the bridges. The road is laid with 66-pound steel rails, which were put down under direction of Road Master John H. Ainsworth. The whole cost of the branch, including one-half of the bridge over the Delaware, up to the end of the fiscal year, was $1,095,367.53, or $53,433 per mile.

The early completon of the Delaware & Bound Brook road will complete the new route to New York over that road and the Central of New Jersey, which will be known as the New York & Philadelphia New Line.

Steel Fire-Boxes in Europe.

The *Engineer*, in commenting on the report "on the Operation and Management of Locomotive Boilers," made at the last meeting of the Master Mechanics' Association, gives the following statement of the experience in the use of steel on the other side the Atlantic:

"In Great Britain few, if any, stationary boilers, and no marine boilers, are made of steel. Mr. Webb, of Crewe, makes steel locomotive boilers, and possessing as he does a remarkable exemption from the troubles that beset other locomotive superintendents, his steel boilers give him, we understand, no trouble. It is well known that steel, if hard, will not answer for a boiler. On one of our principal railway lines eighteen steel fire-boxes were recently put into as many new engines. The steel was really a beautiful material. It could be bent cold into a double knot. When hot it would assume any form the fancy of the smith suggested. Here was really the much-sought-for metal of the future. The engines had not long been at work, however, until leaking tubes and leaking boxes began to become common. Experience proved that in about three months the new material was utterly unsuitable for fire-boxes, as not only all the tubes, but all the joints leaked, and those steel boxes having been condemned, have at this moment either been all taken out and replaced with copper boxes, or they will be taken out in a very few weeks. The metal here was too soft. With harder metal the result is hardly less unfavorable. It is not an unusual thing for a hard steel fire-box plate to come bodily away from the flange two or three days after the flanging has been done. It is not too much to assert that steel has not been successfully used in this country as a material for boilers, save in a very few insignificant instances, always excepting, we presume, the practice of Mr. Webb, about which he is remarkably reticent.

We are inclined to believe that the writer of the above has judged the merits of steel—at least by implication—prematurely. Steel is a material with qualities differing very materially from those possessed by iron. Its manufacture and treatment require more care to produce any desired result in the quality dissolved, but if the requisite care and knowledge is exercised, the result which can be attained exceeds that which is possible with iron. Steel may be harder, more elastic, tougher, and of very much greater tensile strength than iron. It is, so to speak, a more finely organized material than iron, and must be treated with more consideration. It seems, therefore, rather premature to pronounce against its employment without more experience in its use than we have thus far had. That there should be some difficulty at first in the working and use of such material is not, or ought not to be surprising; and it is, we think, not unreasonable to expect that the trouble which is encountered at first in its use will be overcome as we learn better how to make and how to work it.

The following article appeared in *Engineering* the following week:

"In Great Britain few, if any, stationary boilers, and no marine boilers, are made of steel!" This astonishing assertion, which we quote from a leader in *The Engineer* of last week, must, we think, have been perused with very considerable surprise by a large proportion of our contemporary's readers, and it must have excited inquiries as to whether it had been penned by a writer who, instead of keeping himself informed of what was going on in the engineering world, had passed the last few years of his life in peaceful slumber. Surely a writer in a professional journal ought to know that thousands of tons of steel boiler plates have now been turned out at Bolton, Barrow, Sheffield and elsewhere in this country, and if he does know this what can he imagine has been done with all these plates if they have not been made into boilers? We thought that every one claiming any acquaintance with the subject at all knew that the construction of steel boilers is, and has been for a long time past, steadily increasing. Messrs. Hicks, Hargreaves & Co., of Bolton, alone have turned out considerably over 3,000 tons of steel boilers for stationary purposes, and we believe that they now never make iron boilers unless specially ordered to do so. Messrs. Platt Brothers have for a long time used nothing but steel for the boilers at their enormous establishments, and some of these steel boilers have, we believe, seen over a dozen years' service. Messrs. D. Adamson & Co., and other well-known makers too, have turned out scores of steel boilers for use at mills, &c., and Mr. Adamson has for a long time made it a practice to construct the furnace ends of the flues of Lancashire boilers of steel, even when the rest of the boiler is of iron. Steel boilers also are now in use at sea, notwithstanding *The Engineer's* assertion to the contrary, but as yet the material has not been so extensively used for marine as for stationary purposes. How in the face of such facts our contemporary can make the assertion we have quoted is a puzzle we shall not attempt to solve.

Later on in the same article the writer in *The Engineer* proceeds to say: "It is not too much to assert that steel has not been successfully used in this country as a material for boilers, save in a very few insignificant instances, always excepting, we presume, the practice of Mr. Webb, about which he is remarkably reticent." We have here a reiteration of the absurd statement on which we have already commented combined with an implied doubt as to the success of Mr. Webb's employment of steel on the London & Northwestern Railway. Now, nothing could be more unjust than this in-

sinuation and the implication that Mr. Webb is "reticent" as to the results he has obtained. The truth is that there are no works in the world more freely thrown open to inspection than those at Crewe, while there is probably no locomotive engineer whose practice has been more fully and freely discussed than Mr. Webb's. Mr. Webb has succeeded with steel boilers simply because he makes them of the right class of material and treats that material in the right way. There is no secrecy either as to quality of the material or its treatment, and it is simply ridiculous to imagine that in the case of a line like the London & Northwestern there could be anything like secrecy as to the results. We have ourselves mentioned on several occasions the tests adopted by Mr. Webb to secure uniformity in the quality of the plates used, and it is certain that by maintaining this system of testing and by the proper treatment of the plates during their manufacture into boilers he is able to secure most highly satisfactory results. In saying this we do not wish to give the impression that steel has from the first been successfully used at Crewe. Before the nature of the material was properly understood, Mr. Webb, and Mr. Ramsbottom before him, undoubtedly had failures, but these failures were regarded not as reasons for giving up a valuable material but as lessons teaching how it should be used, and hence the present success.

In the same article the writer in our contemporary speaks especially of steel fireboxes, and he asks: "Will any English locomotive superintendent follow American practice, and carry 120 lbs. in boilers the fireboxes of which are made of steel plates one-fourth of an inch thick?" imagining apparently that such a thickness would be at once condemned in this country as perfectly inadmissible. Yet Mr. Webb has for a long time carried steam at 130 lbs. in boilers having firebox plates 5-16 in. thick, so that the difference between English and American practice is not so very great after all. We ourselves believe that there would be no objection to using 3-16 in. plate for locomotive fireboxes, if only that thickness would permit a proper job being made of the staying. On the London & Northwestern the experience as regards steel fireboxes has not as yet been anything like as extensive as steel boiler shells, nor has it on the whole been so satisfactory; but the knowledge gained has not been thrown away, and we think that Mr. Webb may now be fairly credited with having made a success of steel fireboxes as well as steel boilers. The firebox plates used at Crewe are, after being rolled, dipped while hot into cold water, and are then re-heated and again dipped, this treatment being repeated four times. This mode of treating fire-box plates—a mode which has also been resorted to in the United States—has a remarkable effect in toughening the plates, while it also weeds out any which are unsuitable. Among the things taught by experience, both here and in America, is the fact that it is desirable to protect the riveted joints of steel fireboxes as much as possible from the action of the fire, and it was this belief which led Mr. Webb to design the system of firebox construction which he now uses, and which we described some time ago (*vide* vol. xvi., page 334), a system by which the corner joints are avoided, while the tube-plate is flanged outwards towards the barrel. It is, however, unnecessary for us to enlarge here upon the Crewe practice, and we have only alluded to it to contradict the insinuations and singular assertions made in our contemporary. Had the writer of the article we have quoted had a moderately decent acquaintance with his subject, or had he, before committing himself in print, taken the trouble to make a few inquiries as to what has been and is being done in this country in the matter of steel boilers, his essay, although less amusing, might perhaps have been more instructive to his readers.

Train Accidents in January.

On the night of the 1st, a south-bound freight on the Mobile & Ohio road was thrown from the track in West Point, Miss., and five cars went down a bank and upset, breaking themselves badly. A brakeman was killed. It is said that the accident was caused by a broken switch-lock, which allowed the switch-rails to be jarred out of place by the train as it passed over.

On the night of the 3d, an express train on the Cincinnati, Richmond & Fort Wayne road struck a misplaced switch at Winchester, Ind., and ran off the track, the engine and express car going down a bank. The road was blocked nine hours. The lock had been broken and the switch purposely set wrong.

On the morning of the 4th, there was a butting collision between two trains on the Erie Railway, near Attica, N. Y., by which both engines were slightly damaged.

On the evening of the 4th a car of a freight train on the Keokuk & Des Moines road ran off the track near Sugar Creek, Ia., blocking the road two hours.

On the night of the 5th, a train on the Southwestern Railroad of Georgia struck a mule on the trestle over Flint River, near Montezuma, Ga., and the engine was thrown from the track, blocking the road some hours.

On the morning of the 6th the second section of a freight train on the Louisville & Nashville road ran into the first section near Drake's Creek, Tenn., wrecking six cars and killing a drover who was in the caboose. The road was blocked four hours. The forward section was just pulling out from a water tank where the second one did not intend to stop, having been informed at the preceding station that the first section was 30 minutes ahead of him.

On the morning of the 7th an Indianapolis & Vincennes passenger train ran off the track near the Union depot in Indianapolis, causing some delay to trains.

On the 7th several cars of a freight train on the Detroit & Milwaukee road were thrown from the track in Owosso, Mich., by the spreading of the rails, blocking the road some hours.

On the afternoon of the 8th a freight train on the Hartford, Providence & Fishkill road ran off the track near Waterbury, Conn., wrecking several cars.

On the afternoon of the 8th a train on the New York Central & Hudson River was thrown from the track at East Buffalo, N. Y., by a misplaced switch.

On the 10th, the second section of a freight-train on the Central Railroad of Georgia, got stalled on a grade at McCall's Mill, Ga., and the third section ran into its rear, wrecking several cars. The engineman of the stalled train got frightened and jumped, leaving the throttle wide open, and a moment after his engine broke loose, went ahead at a great speed, and ran into the rear of the first section, wrecking several more cars.

On the morning of the 12th, as an express train on the Norwich & Worcester road was near Dayville, Conn., a truck axle broke under the engine, throwing it from the track and damaging it somewhat.

On the morning of the 12th, a train on the Jacksonville, Pensacola & Mobile road ran off the track near Lake City, Fla., and the engine upset into the ditch, several cars being somewhat broken. The accident is said to have been caused by the spreading of the rails.

On the morning of the 13th, a train on the Jacksonville, Pensacola & Mobile road was thrown from the track near Baldwin, Fla., doing some damage. The track is said to be in a wretched condition.

On the 14th, an engine on the Louisville & Nashville road was thrown from the track by a loose rail, in the yard at Nashville, Tenn.

On the afternoon of the 14th a mail train on the Vermont Central road struck a broken rail near White River Junction, Vt., and three cars were thrown from the track and went down a bank, the rear one being badly broken. One passenger was severely and six slightly hurt.

On the afternoon of the 14th an express train on the Vermont Central road ran into the rear of a freight which was just going upon a siding at West Randolph, Vt., damaging several cars.

Early on the morning of the 15th a stock train on the Lake Shore & Michigan Southern road ran over a misplaced switch at Geneva, O., and into the rear of a freight which was lying on the siding. The engine was badly wrecked and 23 cars of the freight were piled up and badly broken, some of them completely wrecked. One man, who was in the caboose, was killed. The switchman claims that he set the switch right after letting the freight in upon the siding and then removed the light, it being near daylight; several trainmen believe that they saw him do so. In that case it is difficult to say how the switch was misplaced. The wreck caught fire but was put out by the Geneva Fire Department.

On the afternoon of the 17th a mixed train on the Intercolonial road was thrown from the track near Windsor Junction, N. S., and several freight cars were badly broken. The accident was caused by the spreading of the rails.

On the night of the 17th there was a collision between two freight trains on the Ohio & Mississippi road, at Moore's Hill, Ind., by which several cars were wrecked and the road blocked some time.

On the night of the 17th a freight train on the Illinois Central road broke in two near La Salle, Ill., and the rear part afterwards ran into the forward one, wrecking 16 cars.

On the night of the 17th four cars of a freight train on the Michigan Central road were thrown from the track at Jackson, Mich., by a misplaced switch. It is said that a loose door hanging from a box car struck the switch lever and turned it.

On the 18th a passenger train on the Lake Erie Division of the Baltimore & Ohio road ran into the rear of a freight train near Lexington, O., damaging several cars and injuring the engineman and one passenger.

On the 18th a passenger train on the St. Louis & Southeastern road was thrown from the track at Norton's Gap, Ky., by a broken rail, blocking the road four hours.

On the evening of the 18th a train on the New York Elevated Railroad ran into the rear of the preceding one, which was just stopping at a station, doing some slight damage. There was a dense fog at the time, and the rails were also so slippery that the brakes did not stop the train as quickly as usual.

On the 20th a freight train on the Allegheny Valley road ran into the rear of another in Lawrenceville, Pa., breaking a box car.

On the evening of the 20th, at Garr Creek, Ind., on the Toledo, Wabash & Western road, a train jumped the track and the engine ran through the depot, making a complete wreck of it. Three cars following were badly broken and the track blocked some hours.

On the night of the 20th an express train on the Vandalia line struck a broken rail near East St. Louis, Ill., and the engine and two cars were thrown from the track, injuring the baggage-master and blocking the road all night.

On the night of the 20th a train on the Toledo, Peoria & Warsaw road ran into a passenger coach which was standing on the Y at the junction of the main line and Burlington Branch in La Harpe, Ill., breaking the car badly and injuring two passengers besides several bruised. It appears that it is customary to leave the car there to be picked up by the train when it comes along, and the accident seems to have resulted from gross carelessness.

Early on the morning of the 21st an Illinois Central freight train ran into a Toledo, Peoria & Warsaw passenger train at the crossing of the two roads in Gilman, Ill., breaking the tender and injuring the engineman slightly.

Early on the morning of the 21st, as a switching engine on the Peoria & Springfield road was running to the water tank at Peoria, Ill., it ran into the head of a freight engine which was moving up to a siding, doing some damage to both.

On the morning of the 21st the watchman at Walpole, Mass., on the New York & New England road, took an engine out of the house to pump it up. Returning at too great speed, he was unable to stop in time, and backed across the turn-table, running the tender and back drivers off the track and carrying away about 12 feet of the engine-house. A train was delayed some time.

On the 21st a train on the New Orleans, St. Louis & Chicago road was thrown from the track near Chatawa, Miss., and three passenger cars were badly broken. Five persons were seriously hurt.

On the 21st a freight train on the South & North Alabama road was thrown from the track near Decatur, Ala., blocking the road six hours.

On the evening of the 21st a mixed train on the St. Louis, Keokuk & Northwestern road ran over a misplaced switch at Canton, Mo., and the engine and several cars left the track, the engine upsetting and blocking the road 12 hours.

Near noon on the 22d, a freight train on the Marietta & Cincinnati Railroad went down with the bridge over Spring Grove avenue in Cincinnati, five cars and the engine being piled up with the wreck of the bridge in the street below. The engineman, fireman and a brakeman were killed, and two men who were passing under the bridge were badly hurt. The bridge was a double-track iron one, built at the Phœnixville Bridge Works, and had been inspected and found to be in good condition but a few days before. A coroner's jury made an investigation, and after taking a great mass of testimony, much of it conflicting and some apparently impossible, and after very careful consideration, they found it as their belief that the accident was caused by the rear driving axle of the engine breaking and the driving wheel on one side swinging loose from the engine, striking and breaking one of the quarter-posts of the bridge near the east abutment.

On the 22d, four cars of a freight train on the Lake Superior & Mississippi road were thrown from the track near Forest Lake, Minn., by a broken rail. The cars went down a bank 12 feet high and were badly broken.

On the afternoon of the 22d, a train on the Northern Division of the Intercolonial Railway was thrown from the track in a heavy snow drift near Dalhousie, N. B., and the snow-plow and engine were badly wrecked, injuring the fireman.

On the night of the 22d, a stock train on the Valley Branch of the Baltimore & Ohio was thrown from the track by a broken rail near Charlestown, W. Va., wrecking several cars and killing some stock. The engine and five cars passed over safely, and the next five were thrown off. The track was blocked for a day.

Early on the morning of the 23d a freight train on the Hannibal & St. Joseph road ran into two cars which had in some way been run out of a siding at Callao, Mo., throwing the engine off the track, breaking the cars and blocking the road several hours.

On the morning of the 23d some cars of a coal train on the New York Division of the Pennsylvania Railroad were thrown from the track at Marion, N. J.

On the 23d there was a collision between two freight trains on the Parkersburg Branch of the Baltimore & Ohio near Long Run, W. Va., by which both trains were wrecked and two trainmen hurt.

On the 23d an engine on the Providence & Worcester road was thrown from the track at Valley Falls, R. I., by a misplaced switch and slightly damaged.

On the evening of the 23d the engine and three cars of an express train on the New York Division of the Pennsylvania Railroad were thrown from the track and slightly damaged by a misplaced switch in Trenton, N. J.

On the morning of the 24th a lumber train on the Brunswick & Albany road was thrown from the track near Tebeauville, Ga., by a misplaced switch, burying the engine in the sand and wrecking five cars.

On the evening of the 25th an express train on the New York & New England road ran over a misplaced switch at the Southbridge Branch junction in East Thompson, Conn., and into the rear of a freight train which was standing on the branch track. Two freight cars and the engine and baggage car of the express were badly broken.

On the 26th a train on the Indianapolis, Bloomington & Western struck the caboose of a freight which had gone upon a siding at Covington, Ind., but did not quite clear the main track, breaking the caboose and damaging a passenger car.

On the evening of the 26th a box car in a freight train on the Erie Railway broke down and was thrown from the track near Hawthorn, N. J., causing some delay of trains.

On the night of the 26th a freight train on the St. Louis, Iron Mountain & Southern road run into a washout near Iron Mountain, Mo., wrecking several cars.

On the evening of the 27th a switching engine in the Keokuk & Des Moines yard at Keokuk, Ia., backed some cars upon an engine standing on a siding, breaking the engine and a caboose badly.

On the evening of the 27th an express train on the New York Central & Hudson River road struck the bars of iron which had been laid across the track, at a point near Geddes, N. Y., throwing the forward wheels of the engine truck from the rails. The bars had evidently been put there for the purpose of wrecking the train.

On the morning of the 28th a freight train on the Marietta & Cincinnati road ran into a rock which had fallen upon the track in a cut near Athens, O., and the engine and five stock cars were thrown from the track and piled up in a cut, making a very bad wreck and blocking the road 14 hours.

On the 28th a train on the Cairo & St. Louis road ran off the track at Red Bud, Ill., injuring the engineman and fireman.

On the 28th an engine on the Central Pacific road was thrown from the track and badly wrecked by ice and snow which had gathered upon the rails at Blue Canon, Nev. The fireman was killed and the engineman badly hurt.

On the morning of the 29th as an express train on the Indianapolis & St. Louis road was passing Webster, Ill., a coal shute broke from its fastenings and fell across the track, knocking the cab of the engine to pieces and otherwise damaging it.

On the evening of the 29th an express train on the Indianapolis, Bloomington & Western road ran into the head of a switching train in the Indianola yard, near Indianapolis, Ind., breaking both engines badly and injuring two trainmen and a passenger. It is said that the engineman of the switching engine knew the express was due, but thought he had time to run across the yard.

On the night of the 29th four cars of a freight train on the New Haven and Northampton road ran off the track on a bridge near Westfield, Mass., injuring the bridge and damaging the cars a little.

About noon on the 31st a car in a freight train on the Cincinnati, Hamilton & Indianapolis road ran off the track in Indianapolis, Ind., and went down a bank into Pogue's Run.

On the 31st a snow plow and two engines were thrown from the track in a heavy drift on the Central Pacific, near Ogden, Utah.

This is a total of 60 accidents, whereby eight persons were killed and 29 injured. Six accidents caused the death of one or more persons, 10 injury but not death, while 44, or 73⅓ per cent. of the whole were not accompanied by any accident serious enough for record.

These accidents may be classified as to their nature and causes as follows:

COLLISIONS:	
Rear collisions	14
Butting collisions	3
Crossing collisions	1
Unexplained	2
	— 20
DERAILMENTS:	
Unexplained	11
Misplaced switch	8
Broken rail	5
Spreading of rails	4
Snow or ice	3
Broken axle	2
Broken down car	1
Wash-out	1
Malicious obstruction	1
Accidental obstruction	1
Cattle on track	1
Bad track	1
	— 39
Engine broken by accidental obstruction	1
Total	60

One collision was caused by a runaway engine, two each by want of signals or failure to use them, by misplaced switches and by carelessness in leaving cars projecting over a siding, and one by a train breaking in two. The number of misplaced switches is still large, 10 accidents, or one-sixth of the whole, being caused by them; in one case the switch was purposely opened, in another it was jarred open, the fastening being broken. The number of collisions is proportionately very large, one-third of the whole, the rear collisions alone being nearly one-fourth of the whole. One accident, that at the Spring Grove Bridge in Cincinnati, is involved in some doubt from the conflicting nature of the testimony of those who were in the accident. The weight of evidence seems to be with the conclusion of the jury, that the breaking of the bridge was caused by a driving-wheel thrown off from the engine by the breaking of the axle. Seventeen accidents were caused directly by defects or failures of road or equipment.

The number of accidents is less than that of any of the past six months. As compared with January, 1875, there is a decrease of 71, over one-half, in accidents; of 2 in the number killed, and of 67, more than two-thirds, in the number hurt. This is due in great measure to the absence of severe weather and of snow. The broken rails are few in number for the season, and there are very few derailments resulting directly from snow or ice, which last year happened in numbers.

For the year ending with January the record is as follows:

	No. of accidents.	Killed.	Injured.
February	211	11	186
March	122	17	73
April	60	9	67
May	54	6	43
June	61	23	67
July	73	33	80
August	114	37	110
September	116	50	123
October	88	12	74
November	87	24	97
December	84	13	63
January	60	8	29
Totals	1,130	222	1,060

The averages per day for the month are 1.94 accidents, 0.26 killed and 0.94 injured; for the year they are 3.10 accidents, 0.64 killed and 2.85 injured. The number of injured is less than for any month of the twelve.